The World Within Us

This book is an adaptation of a thesis draft worked out by one of us (VC). In this book, we outlined some new findings in nonlinear collective dynamics associated with psychosynthesis, socio-economics modelling and cosmology theorizing. Hopefully, this study will enable new insights in these fields derived from collective phenomena study.

In other words, in this work we would like to give a support for gotong-royong as an intermediate policy just like Anthony Giddens's Third way, but we develop a new framework from psychosynthesis (extension to Jung's personality model) to socio-economics model based on analogy with fermion and boson in particle physics. This is our result.

If there is a deep lesson that we would like to share here, it is this: "In every tension between opposite sides, it is often helpful to find out the third alternative, and may be fourth and so on." That would make us wiser and not so quick to jump into another despot's bandwagon.

In the same way, third and modest way is good in spiritual endeavor too, like an old story of Siddharta Gautama's enlightenment: "Don't pull the strings too hard."

In this way, we stand beside the late Prof. Milad Hanna, a Coptic Church leader who opposes both Marx and his later follower of destructive philosophy: Samuel Huntington from Council of Foreign Relations. They intended to create havocs and much more havocs in this world, and that is why such a cruel policy cannot be accepted anymore.

The first chapter contains an unpublished draft paper where we discuss a criticism toward the notion of utility. It is known that economics in essence is a science of utility maximization, so the notion of utility is quite fundamental.

This book is suitable for graduate students in physics sciences or interdisciplinary studies, as well as for professional physicists who wish to find some fresh look at the problems in our modern society.

Enjoy reading

VC & FS

Penerbit Cunoia Media
Jl. Sidomakmur No. 75A
Sengkaling - Dau - Malang
65151
Email: devine.adv.0415@gmail.com

ISBN 978-1-59973-651-8
9 781599 736518

The World Within Us

Some New Findings in Nonlinear Collective Dynamics

V. Christianto and Florentin Smarandache

Mid August 2018

Penerbit Cunoia Media

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The World within Us:
Some new findings in nonlinear collective dynamics,
August 2018

Victor Christianto & Florentin Smarandache

Full names and affiliations:

- Victor Christianto, Malang Institute of Agriculture (IPM), Indonesia. http://www.sci4God.com
- Florentin Smarandache, PhD. Chair of Mathematics and Sciences, University of New Mexico, New Mexico, USA. Gallup, New Mexico 87301, USA; e-mail: smarand@unm.edu

Publisher note:

Eunoia Media Publishing
Companies House
Jl. Sidomakmur No. 75A Sengkaling - Dau - Malang 65151
Email: divine.adv.0415@gmail.com

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"Every man must decide whether he will walk in the light of creative altruism or in the darkness of destructive selfishness.

-- Martin Luther King Jr., civil rights leader

"Better light a candle than curse the darkness."

– Confucius

DEDICATION

This work is dedicated to:

a. All people of Republic of Indonesia in this 73th anniversary of Independence Day, 17-8-2018

b. Mr. President Joko Widodo and his Kabinet Kerja (working cabinet)

c. My brothers and sister and also family and relatives in other towns

d. All brothers and sisters and fellow ministers in Jesus Christ, who try to do His Will either in Russia, Asia, Africa, Europe, Latin America through all corners of the world.

e. All people of God who do so many acts of kindness to serve those in need and despair (following Matt. 25).

Listen to the following words of God for you:

"2 The people that walked in darkness have seen a great light: they that dwell in the land of the shadow of death, upon them hath the light shined.

3 Thou hast multiplied the nation, and not increased the joy: they joy before thee according to the joy in harvest, and as men rejoice when they divide the spoil.

4 For thou hast broken the yoke of his burden, and the staff of his shoulder, the rod of his oppressor, as in the day of Midian.

5 For every battle of the warrior is with confused noise, and garments rolled in blood; but this shall be with burning and fuel of fire." – Isaiah 9:2-5

John 8:32

"And ye shall know the truth, and *the truth shall make you free*."

INTRODUCTION

Shalom Aleikhem,

Recalling my submitted dissertation draft back then around 2008, at the time, my graduate problem was not completed in RUDN. And even after some months to listen many lectures by Professor Vladimir Kassandrov et al, I did not know how to improve my thesis draft. Other than that, there were other problems occurring at the time which made me deciding to back home.

Over these years, Lord Jesus Christ and Holy Spirit taught me many things that I never learned before, and therefore I felt time has come to reconsider my doctoral program. This time it is not about cosmology only but covering several fields including psychosynthesis and also economics theorizing. The title of proposed dissertation is something like:

"Some new findings in nonlinear collective dynamics associated with psychosynthesis, socio-economics and cosmology theorizing."

Enclosed are a book adapted from that dissertation, hopefully you may find this manuscript useful either to improve organization performance or to understand better some collective phenomena around you.

Your comments are welcome.

Thanks for reading this book and may God be with you,

Victor Christianto

PREFACE

Victor Christianto's Thesis that combine Psychosyntesis, Socio economics and Cosmology is a tough but interesting subjects, but I believe he is able to do it well. Victor and I often discuss such tough subjects and he shows abilities to suggest new way of thinking to solve the problems.

Recent topics of discussions the Origin of Cosmic Life, The God of Multiverse (?), Cosmic Consciousness, Are Angels Aliens (?), Aliens and UFO in the Bible, etc.

I think his thesis will contribute to Christian Theology, Socio economics, and Cosmology also to other similar fields.

Sincerely,

Prof Dr. The Houw Liong

Professor of Physics (Emeritus), Bandung Institute of Technology & Telkom University, Bandung - INDONESIA

Email: thehl007@gmail.com

url: https://www.linkedin.com/in/houwliong/

***added note:**

It is interesting to compare with Jung's viewpoints : Like Freud (and Erikson) Jung regarded the psyche as made up of a number of separate but interacting systems. The three main ones were the ego, the personal unconscious, and the collective unconscious. According to Jung, the ego represents the conscious mind as it comprises the thoughts, memories, and emotions a person is aware of. The ego is

largely responsible for feelings of identity and continuity. Like Freud, Jung (1921, 1933) emphasized the importance of the unconscious in relation to personality. However, he proposed that the unconscious consists of two layers. The first layer called the personal unconscious is essentially the same as Freud's version of the unconscious. The personal unconscious contains temporality forgotten information and well as repressed memories. Jung (1933) outlined an important feature of the personal unconscious called complexes. A complex is a collection of thoughts, feelings, attitudes, and memories that focus on a single concept. The more elements attached to the complex, the greater its influence on the individual. Jung also believed that the personal unconscious was much nearer the surface than Freud suggested and Jungian therapy is less concerned with repressed childhood experiences. It is the present and the future, which in his view was the key to both the analysis of neurosis and its treatment. However, by far the most important difference between Jung and Freud is Jung's notion of the collective (or transpersonal) unconscious. This is his most original and controversial contribution to personality theory. This is a level of unconscious shared with other members of the human species comprising latent memories from our ancestral and evolutionary past. 'The form of the world into which [a person] is born is already inborn in him, as a virtual image' (Jung, 1953, p. 188). According to Jung, the human mind has innate characteristics "imprinted" on it as a result of evolution. These universal predispositions stem from our ancestral past. Fear of the dark, or of snakes and spiders might be examples, and it is interesting that this idea has recently been revived in the theory of prepared conditioning. However more important than isolated tendencies are those aspects of the collective unconscious that have developed into separate sub-systems of the personality. Jung called these ancestral memories and images archetypes.

Archetypes

Archetypes (Jung, 1947) are images and thoughts which have universal meanings across cultures which may show up I dreams, literature, art or religion. Jung believes symbols from different cultures are often very similar because they have emerged from archetypes shared by the whole human race. For Jung, our primitive past becomes the basis of the human psyche, directing and influencing present behavior. Jung claimed to identify a large number of archetypes but paid special attention to four. The "persona" (or mask) is the outward face we present to the world. It conceals our real self and Jung describes it as the "conformity" archetype. This is the public face or role a person presents to others as someone different to who we really are (like an actor). Another archetype is the anima/animus. The "anima/animus" is the mirror image of our biological sex, that is, the unconscious feminine side in males and the masculine tendencies in women. Each sex manifests attitudes and behavior of the other by virtue of centuries of living together. The psyche of a woman contains masculine aspects (the animus archetype), and the psyche of a man contains feminine aspects (the anima archetype). Next is the shadow. This is the animal side of our personality (like the id in Freud). It is the source of both our creative and destructive energies. In line with evolutionary theory, it may be that Jung's archetypes reflect predispositions that once had survival value. Finally, there is the self which provides a sense of unity in experience. For Jung, the ultimate aim of every individual is to achieve a state of selfhood (similar to self-actualisation), and in this respect, Jung (like Erikson) is moving in the direction of a more humanist orientation. That was certainly Jung's belief and in his book "The Undiscovered Self" he argued that many of the problems of modern life are caused by "man's progressive alienation from his instinctual foundation." One aspect of this is his views on the significance of the anima and the animus.

Jung argues that these archetypes are products of the collective experience of men and women living together. However, in modern Western civilization men are discouraged from living their feminine side and women from expressing masculine tendencies. For Jung, the result was that the full psychological development both sexes was undermined. Together with the prevailing patriarchal culture of Western civilization this has led to the devaluation of feminine qualities altogether, and the predominance of the persona (the mask) has elevated insincerity to a way of life which goes unquestioned by millions in their everyday life.

Critical Evaluation

Jung's ideas have not been as popular as Freud's. This might be because he did not write from the layman and as such his ideas were not a greatly disseminated as Freud's. It may also be because his ideas were a little more mystical and obscure, and less clearly explained. On the whole modern psychology has not viewed Jung's theory of archetypes kindly. Ernest Jones (Freud's biographer) tells that Jung "descended into a pseudo-philosophy out of which he never emerged" and to many his ideas look more like New Age mystical speculation than a scientific contribution to psychology. However, while Jung's research into ancient myths and legends, his interest in astrology and fascination with Eastern religion can be seen in that light, it is also worth remembering that the images he was writing about have, as a matter of historical fact, exerted an enduring hold on the human mind. Furthermore, Jung himself argues that the constant recurrence of symbols from mythology in personal therapy and in the fantasies of psychotics support the idea of an innate collective cultural residue. In line with evolutionary theory it may be that Jung's archetypes reflect predispositions that once had survival value.

However, Jung's work has also contributed to mainstream psychology in at least one significant respect. He was the first to distinguish the two major attitudes or orientations of personality – extroversion and introversion. He also identified four basic functions (thinking, feeling, sensing, and intuiting) which in a cross-classification yield eight pure personality types. Psychologists like Hans Eysenck and Raymond Cattell have subsequently built upon this. As well as being a cultural icon for generations of psychology undergraduates Jung, therefore, put forward ideas which were important to the development of modern personality theory.

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FOREWORD

Victor Christianto

Abstract

Foreword is a place where normally authors try their best bragging their results and diminishing others' work. Nonetheless, I tried to refrain from such a habit which seems to me more or less sound like Messiah-syndrome. What else can I say? Even nine years ago, when I was still studying in Moscow, by any measure I was a quite old *aspirantura*,[1] who seemed not sure on what I was looking for. But thanks to Holy Father in Heaven, He rescued me from the drama of Muscovians so I can return to my home country and then throughout these years I have learned many more from Him more than I would have learnt anywhere. This is what I would like to share in this dissertation: things I unlearned, things I relearned and things which are still mystery to me. After all, this is what I can do as a religious learner, not just thinking in tongue,[2] but also to do something good for other people to the extent of what life permits, or you may say: *"tikkun olam."*[3]

1 http://en.russia.edu.ru/edu/description/sysobr/925

2 James K. Smith. Thinking in Tongues. Pentecostal Contributions to Christian Philosophy. url: https://www.eerdmans.com/Products/6184/thinking-in-tongues.aspx

3 **Tikkun Olam.** A jewish concept defined by acts of kindness performed to perfect or repair the world. The phrase is found in the Mishnah, a body of classical rabbinic teachings. It is often used when discussing issues of social policy, insuring a safeguard to those who may be at

Introduction

As an old Chinese proverb says: "A journey of a thousand miles begins with a first step,"[4] so did I while applying visa at the Russia Federation's Embassy office in Jakarta, around October 2008. Then my journey began with a small step into a freezing Domodedovo Airport around December 2008. Two persons were so kind to pick me up at the Airport, i.e. Yuri (another aspirantura at the time) and Prof. Michael Fil'chenkov from Institute of Gravitation and Cosmology, RUDN.

I still remembered a question I asked to Prof. Fil'chenkov at the vehicle back to Moscow, something like: "Is it possible to extend Friedmann equation into a rotating early universe?"

And few days later, I began to explore Moscow and also RUDN, including attending classes. In the fifth day, Prof. Fil'chenkov invited me to come to Moscow State University, because there was a lecture by Prof. Anosov, on relation between fundamental constants. I went to MSU with another friend, Sergey, and found the lecture quite interesting.

Going back to RUDN using Metro commuter was rather confusing at those early days, and I got stuck for more than 90 minutes because getting out from train at a wrong station. But finally, an old lady asked me: *"Are you a studentski? From RUDN? Come… I shall show you the way."*

That was how my day was saved by an old unnamed angel…

There were many occasions like that which I experienced in Moscow, which can be an otherwise cold and individualistic big Metropolitan.

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a disadvantage. url: https://www.learningtogive.org/resources/tikkun-olam

4 Chinese: 千里之行，始於足下; pinyin: Qiānlǐ zhī xíng, shǐyú zú xià (literally: "A journey of a thousand li starts beneath one's feet")

Well, you may consider that I was trying to romanticize the common altruism in everyday life in Moscow, but I do believe that altruism and kindness are the common traits that make us genuine human being. Other than that, we will be animals or robots.

There were all sorts of people who showed kindness and altruism during my 5 months or so in Moscow, for instance: there was Erica, a student from Germany, who met me while I was starring the stars at a night in a park somewhere, -- whom I never met again since then.

And there were good professors who did their best to translate their lectures from Russian to English, so I could understand at least a bit.[5] I felt really at home in the *Institute of Gravitation and Cosmology*, RUDN, even if my life was not so easy because the scholarship there did not arrive. I enjoyed discussions with others like Vsevolod, Sergey, Tonja, Anastasia, Milena, and also some nice conversations with Prof. Douglas Singleton from Fresno.[6]

I also enjoyed discussions with Prof. V. Kassandrov while walking from and to station from RUDN Campus.

And if some of you ask me, what was the result of studying there in IGC? I would answer as follows: despite my thesis draft was not accepted at the time, at least I learned some things those days. And at the end, I managed to write up a paper which is my answer to assignment given by Professor A. Yefremov, few months before I departed to Moscow. At the time, he asked if it is possible to re-derive 6-dimensional Maxwell equations starting from his Quaternion space theory, and I proved it in a paper published later in 2010. (see Appendix I).

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5 Special thanks to Prof. M. Fil'chenkov, Prof. V. Ivashchuk, Prof. V. Kassandrov, Prof. Kiril Bronnikov et al.

6 http://www.fresnostate.edu/csm/physics/people/faculty/doug-singleton.html

Why am I submitting this?

In short, I saw many good people in downtown life of Moscow, or at least around RUDN life.

So, even I saw clearly that I should end my master and aspirantura program before it was completed, somehow I felt really connected.

Therefore, after 8-9 years passed I thought there may be a chance to connect again with my unfinished program, but this time with another eye…an eye made to see by the work of Jesus Christ.

What makes me thinking that I should come up with an entirely new approach to socio-economics and cosmology theorizing:

a. A word of very wise advice by Prof. Kassandrov: *you ought to learn to have a big heart…*
b. A small question by a senior professor in his cosmology classroom, i.e. Prof. Yu Vladimirov[7] from MSU once asked me: "Where do you come from?" I answered: "Indonesia." Then he smiled: *"Ah, Indonesia? I remember Soekarno*."

That is what I remember so far from those many lectures over 5-6 months, that you ought to have a big heart and that it seems worthy enough to start with our historical and cultural legacy as Indonesians, instead of being someone else.

Novelty aspects of this document

In this work I would like to solve the problem of human tension between greed and altruism, between individualism and collectivism from a physicist's viewpoint. I tried to shed some light on this root issue of human society, based on a recent book by Prof. Adam Grant from Wharton: Give and Take. More clearly:

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7 http://www.chronos.msu.ru/old/EREPORTS/vladimirov1.pdf

A. On experimental paper

The result that I reported in part I may be not so clear for common readers, therefore allow me to point out some hints: It is known from any economics textbook that individual pursuit to maximise utility function is a primary tenet in economics study. But what is exactly "utility"? My little experiment with a group of pigeons seem to suggest that the notion of utility does not contribute much to achievements toward wealth. Just like what we observe in management, tangible or monetary benefits are only a factor in workers' satisfaction and happiness. Feeling at home with peers and corporate culture may be a more motivating elements in an organization. In other words, this small experiment leads to question the exact role and relevance of utility function in economics theorizing, as McCauley puts it: "the futility of utility."[8]

B. Psychosynthesis

I also give a support for gotong-royong philosophy as an intermediate policy just like Anthony Giddens's Third way, but I develop a new framework from psychosynthesis (extension to Jung's personality model) to socio-economics model based on analogy with fermion and boson in particle physics. This is our result.

This leads me to reconsider our cultural legacy in many Indonesia's villages: gotong royong, but in a new light of Olson's collective action. I also submit a solution of Olson's collective action problem, which seems worthy to reconsider in these days. (see paper 2 in Part II).

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8 Joseph L. MacCauley. Futility of Utility. Url: https://mpra.ub.uni-muenchen.de/2163/1/MPRA_paper_2163.pdf

C. On collective emotion paper

In other paper (no. 3 in Part II) a leader needs to pursue healthy collective actions and collective emotion if he/she wants to achieve not only national wealth but also national average happiness level.

D. Finally, in cosmology study, I tried to depict a possibility to investigate how nonlinear shallow water equation (KdV) can relate to cellular automaton universe, then it may be connected to Lotka-Volterra equation which is well-known in mathematical biology.

Motivations

a. Indonesia's contemporary challenge

We are fully aware, that USA is in their peak economics performance while leaving other country leaders in Asia scratching their heads. Meanwhile, China seems to lead in terms of industrial and technology power.

So, it seems Indonesia's leaders have to come up with answer: whether to follow capitalism-neolib movement, or go to old socialism-communism which proved to fail in the past. Going to an extrasolar planet is not an option, so there is only one more path, to explore if there is any kind of third way, just like Anthony Giddens helped Tony Blair reformulated his policy.

Thanks God, I just realized that I have been researching for more than 12 years with a very original mathematician, Prof. Florentin Smarandache, who have developed so many new directions in research, beyond Lotfi Zadeh's fuzzy logic.

With Neutrosophic Logic, Smarandache argues that in every fields in our reality, it is often needed to go beyond Aristotelian's binary logic, i.e. we should study the dynamics of neutralities.

In other words, for every proposition <A> and its negation <anti-A>, there is always <neut-A>. That is the essence of Smarandache's Neutrosopohic Logic.[9]

Following this very simple argument, we can draw a simple table showing how a third option (not only Plan B, but also Plan C etc.) is very helpful in order to make a realistic decision in this often confusing situations:

Table 1: <neut-A> in real situations

<A>	<anti-A>	<neut-A>	Atributted to
day	Night	sunrise/sunset	
breakfast	lunch	brunch	(French's way?)
pessimistic	optimistic	pess-optimistic	
revolution	status quo	ahimsa movement	M. Gandhi[10] (and later Martin Luther King Jr.)
fear	trust	prudent	
realism	utopianism	Realism in hope	(T.B. Simatupang)
capitalism	socialism	gotong royong	(Indonesia's way)
secular country	religious country	Pancasila country[11]	(Indonesia's way)

9 See for instance: F. Smarandache, Neutrosophic Logic. url: https://arxiv.org/ftp/math/papers/0303/0303009.pdf. Also Charles Ashbacher, Introduction to Neutrosophic Logic, https://www.gallup.unm.edu/~smarandache/IntrodNeutLogic.pdf

individualism	collectivism	indivi-group	(my proposed terminology)
fermion	boson	ferson	(my proposed terminology)

10. M. Gandhi[10]
11. Pancasila country[11]

That is an outline of main theme of this dissertation, that there is always a tension between individualism and collectivism in all sorts of human organizations,[12] but it does not necessarily mean to be a series of revolutionary dialectics as a way to human progress a la Hegel or Marx or Huntington. In other words, I think it is dangerous to think that human being do progress in terms

10 **Ahimsa** (also ahiṃsā, **ahinsa**, Sanskrit:अहम्सि) is a Sanskrit word which means "non-violence" or "non-injury". The practice of **ahimsa** is an important aspect of religions like Hinduism, Jainism and Buddhism.

11 A simple definition of Pancasila country: the country admits all major religions, and all inhabitants are religious but it is not a religious country.

12 See for instance: Harry C. Triandis and also Geert Hofstede's works. See Chapter 1 in Part I. While our proposed simplifying analogy of human behaviour, i.e. individualism and collectivism sound not so common. Indeed such cultural psychology research has been reported since Harry C. Triandis et al. See for example: (a) The Self and Social Behavior in Differing Cultural Contexts, Psychological Review, vol. 96 no. 3; (b) Harry C. Triandis and Eunkook M. Suh, CULTURAL INFLUENCES ON PERSONALITY, Annu. Rev. Psychol. 2002. 53:133–60; (c) J. Allik & A. Realo, Individualism-collectivism and social capital, JOURNAL OF CROSS-CULTURAL PSYCHOLOGY, Vol. 35 No. 1, January 2004, 29-49. This last mentioned paper includes a quote from Emile Durkheim: "The question that has been the starting point for our study has been that of the connection between the individual personality and social solidarity. How does it come about that the individual, whilst becoming more autonomous, depends ever more closely upon society? How can he become at the same time more of an individual and yet more linked to society?"

of revolutions over another bloody revolutions. In a similar way, "order out of chaos"[13] or "creative destruction" or "disruptive changes" are just political jargons in order to put all mankind into just another form of modern slavery.

And Indonesia's preface of constitution declares that we should strive against all slavery and injustice in this world.

b. Religious motivation

For long time, I also asked an old question to myself: "Is capitalism or socialism the correct way for a Christian?"[14]

During my college days, I've been influenced by reading both sides of the story: from reading economics books by E.F Schumacher etc, but at the same time reading Jurgen Habermas and Paolo Freire etc. And I also found that many Christian scholars seem to have a rather leftist position in terms of economics thinking.[15]

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13 From the Latin: Ordo ab chao, which appears to be motto of Illuminati. Check: http://www.orwelltoday.com/stagedevents.shtml

14 It is not so obvious from the Bible, if Jesus lives today: which position will He take? Left or right wing? As Peter Kreeft wrote in The Philosophy of Jesus, "All political issues today are seen through the prism of Right vs.Left,the political "us vs.them." The categories are all-encompassing thought-savers, knee-jerks that allow us to avoid thinking about each issue on its own merits. But the categories, and the polarization they create, is even more indefensible when applied to Christ because it means judging Christ by the fallen world rather than vice versa." (p. 144). url: https://portalconservador.com/livros/Peter-Kreeft-Philosophy-of-Jesus.pdf

15 In fact, I am not so sure whether respected organizations like World Council of Churches was not influenced too by so many leftist thinkers (albeit on academic level). One can say that even Karl Barth and Jacques Ellul were influenced by critical leftist thinking, see for instance: Primary Influences on Ellul's Dialectical Worldview, url: http://www.augsburgfortress.org/media/downloads/9781451470390_Ch1.pdf. Perhaps one of Christian philosophers who wrote against the danger of materialism is Prof. Alvin Plantinga: Against Materialism. url: http://andrewmbailey.com/ap/Against_Materialism.pdf

But, since 2-3 years ago I began to realize that there was something wrong in Marx's thoughts, even if he said that he was influenced by communal life depicted in Acts chapter 2. Scholars like Mihai Prunescu[16] and also a theologian from Germany (the late Prof. Eta Linemann[17]) warned that Marx is very dangerous, because he fought against God. This was expressed clearly in his poem "*Oulanem*".[18] Suffice is to say, that Oulanem works like a public statement against God's sovereign power, just like "*Sympathy for the Devil*" for Rolling Stones.

And recently, I also found an old book written by Pastor Richard Wurmbrandt, "*Marx and Satan*",[19] which is in line with Prof. Eta Linnemann's book and also testimony.[20] The front cover of Wurmbrandt's book includes these quotes from Marx:

"I wish to avenge myself against the One who rules above.."
"The idea of God is the keynote of a perverted civilization.
It must be destroyed."

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16 Mihai Prunescu is a mathematics scholar from a university in Germany.

17 Prof. Eta Linnemann was a NT scholar under Bultmann, who taught many years in Marburg, but then she repented and went to Indonesia to teach in an evangelical seminary at East Java until she died.

18 https://en.wikipedia.org/wiki/Oulanem

19 Richard Wurmbrandt, Marx and Satan. Illinois: Crossway Books, 1986.

20 Prof. Eta Linnemann's testimony, 2001, url: https://gracevalley.org/teaching/eta-linnemann-testimony/. Her testimony includes, among other things: "When Professor Bultmann came to the next verse, he said, "Here Paul is not at the usual height of his theology because he is speaking of the resurrection of Christ as if it were a historical fact.' Thus I learned as a young student in my very first term that we were not allowed to think of the resurrection of Christ as a historical fact. This great professor had said it, so it had to be. After all, how could I, as a young student, know more than my professors! ..."

At the same time, there are also many books by economists like Paul Ormerod, Hofstadter[21] etc, who emphasized the fundamental problems with modern economics theorizing known as "capitalism." It should be clear, that part of the core problem in such modern capitalism is "individualism," which results in greed.

Quoting Grekko's remark: *Greed is good*.

*"The point is, ladies and gentleman, that **greed**, for lack of a better word, is good. **Greed** is right, greed works. **Greed** clarifies, cuts through, and captures the essence of the evolutionary spirit. **Greed**, in all of its forms; greed for life, for money, for love, knowledge has marked the upward surge of mankind."*[22]

And into these problems plaguing all over this modern life, I tried to shed some light and derive some new thoughts based on a recent book by Prof. Adam Grant from Wharton: *Give and Take*.

This leads me to reconsider our cultural legacy in many Indonesia's villages: gotong royong, but in a new light of Olson's collective action.

What is gotong-royong?

While gotong-royong was known since long time as one of traditional culture in Indonesia villages, but as a *Philosofische Grondlag* (national philosophy), it was promoted by Soekarno. Let me quote his speech at 1st June 1945 to BPUPKI:[23]

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21 See for example Richard Hofstadter: Social Darwinism in American thought. url: http://culturism.us/booksummaries/SocialDarwinismHofst.pdf

22 The Wall Street (1987). url: https://businessethicsblog.com/2010/10/12/wall-street-1987-greed-is-good/

23 Tadjuddin Noer Effendi. Budaya Gotong-Royong Masyarakat dalam

"Dasar-dasar Negara" telah saya usulkan. Lima bilangannya. Inikah Panca Dharma? Bukan! Nama Panca Dharma ini tidak tepat di sini. Dharma berarti kewajiban, sedang kita membicarakan dasar. Saya senang kepada simbolik. Simbolik angka pula. Rukun Islam lima jumlahnya. Jari kita lima setangan. Kita mempunyai Panca Indra. Apalagi yang lima bilangannya? (seorang yang hadir: Pendawa Lima). Pendawa pun lima orangnya. Sekarang banyaknya prinsip: kebangsaan, internasionalisme, mufakat, kesejahteraan, dan ketuhanan, lima pula bilangannya. Namanya bukan Panca Dharma; tetapi saya namakan ini dengan petunjuk seorang teman kita ahli bahasa namanya Panca-Sila. Sila artinya azas atau dasar, dan di atas kelima dasar itulah kita mendirikan Negara Indonesia, kekal dan abadi. Atau barangkali ada saudara-saudara yang tidak suka akan bilangan lima itu? Saya boleh peras, sehingga tinggal 3 saja.

Saudara-saudara tanya kepada saya, apakah perasan yang tiga itu? Berpuluh-puluh tahun sudah saya pikirkan dia, ialah dasar-dasarnya Indonesia Merdeka, Weltanschauung kita. Dua dasar yang pertama, kebangsaan dan internasionalisme, kebangsaan dan perikemanusiaan, saya peras menjadi satu: itulah dahulu yang saya namakan socio-nationalisme. Dan demokrasi yang bukan demokrasi Barat, tapi politiek-economischedemocratie, yaitu politieke-democratie dengan sociale rechtvaardigheid, demokrasi dengan kesejahteraan, saya peraskan pula menjadi satu: inilah yang dulu saya namakan socio-democratie. Jadi yang asalnya lima itu telah menjadi tiga: socionationalisme, socio-demokratie, dan ke–Tuhanan. Kalau tuan senang kepada simbolik tiga, ambillah yang tiga ini. Tetapi barangkali tidak semua tuantuan senang kepada Tri Sila ini, dan minta satu, satu dasar saja? Baiklah, saya jadikan satu, saya kumpulkan lagi menjadi satu. Apakah yang satu itu? Sebagai tadi telah saya katakan: kita mendirikan Negara Indonesia, yang kita semua harus mendukungnya. Semua buat semua! Bukan Kristen buat Indonesia,

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Perubahan Sosial Saat Ini. *Jurnal Pemikiran Sosiologi* Volume 2 No.1 , Mei 2013

bukan golongan Islam buat Indonesia, bukan Hadi koesoema buat Indonesia, bukan Van Eck buat Indonesia, bukan Nitisemito yang kaya buat Indonesia, tetapi Indonesia buat Indonesia! – semua buat semua! Jikalau saya peras yang lima menjadi tiga, dan yang tiga menjadi satu, maka dapatlah saya satu perkataan Indonesia yang tulen, yaitu perkataan "gotong-royong". Negara Indonesia yang kita dirikan haruslah negara gotong royong. "Gotong-royong" adalah faham yang dinamis, lebih dinamis dari "kekeluargaan", saudara-saudara! Kekeluargaan adalah satu faham yang statis, tetapi gotong-royong menggambarkan satu usaha, satu amal, satu pekerjaan, yang dinamakan anggota yang terhormat Soekardjo: satu karyo, satu gawe! Gotongroyong adalah membanting tulang bersama, pemerasan keringat bersama, perjuangan bantu- binantu bersama. Amal semua buat kepentingan semua, keringat semua buat kebahagian semua. Holupis-kuntul-baris buat kepentingan bersama! Itulah gotong-royong."

To define gotong-royong, we can quote a recent paper (see Appendix IV):

"gotong-royong is the term of mutual self-help indicates that an activity/ task is manifested voluntarily and spontaneous."[24]

In other words, in this work we would like to give a support for gotong-royong as an intermediate policy just like Anthony Giddens's Third way, but we develop a new framework from psychosynthesis (extension to Jung's personality model)[25] to socio-economics model based on metaphor of fermion and boson in particle physics. This is our result.

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24 Adiyanti Sutandyo-Buchholz. "Collective activity as a traditional knowledge behind the physical design. Case of urban *kampungs* in Indonesia." *Planum. The Journal of Urbanism*, vol. 26 no. 1, 2013. www.planum.com

25 See added note by Prof. Thee Houw Liong in preface section.

In Appendix V, there is a presentation on how collective action concept was known for ancient time, Balinese communal irrigation management, i.e. Subak.[26]

Finally, in cosmology study, I tried to depict a possibility to investigate how nonlinear shallow water equation (KdV) can relate to cellular automaton universe, then it may be connected to Lotka-Volterra equation which is well-known in mathematical biology.

Summary

In this dissertation I outlined some new findings in nonlinear collective dynamics associated with psychosynthesis, socio-economics modelling and cosmology theorizing. Hopefully, this study will enable new insights in these fields derived from collective phenomena study.

In other words, in this work we would like to give a support for gotong-royong as an intermediate policy just like Anthony Giddens's Third way,[27] but we develop a new framework from psychosynthesis (extension to Jung's personality model) to socio-economics model based on analogy with fermion and boson in particle physics. This is our result.

If there is a deep lesson that I would like to share here, it is this: "In every tension between opposite sides, it is often helpful to find out the third alternative, and may be fourth and so on." That would make us wiser and not so quick to jump into another despot's bandwagon.

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26 Thanks to Ir. Wayan Widja Pagehgiri, one of former lecturers, who told about Subak in Bali.

27 http://www.andrewleigh.org/pdf/Giddens(AJPS).pdf

In the same way, third and modest way is good in spiritual endeavor too, like an old story of Sidharta Gautama's enlightenment: "Don't pull the strings too hard."[28]

In this way, I stand beside Prof. Milad Hanna, a Coptic Church leader who opposes both Marx and his later follower of destructive philosophy: Samuel Huntington from Council of Foreign Relations.[29]They intended to create havocs and much more havocs in this world, and that is why such a cruel policy cannot be accepted anymore.

Word of Thanks

VC is deeply grateful to his parents for showing the way through their life on how to walk in 3-mile-an-hour speed with God. Special thanks to his elder brother, David, and also Eva and Sony for all kindness. VC is also grateful for a very wise advice by a senior professor of physics, V.V. Kassandrov, back in his short period in Moscow: "you ought to learn to have a big heart." Thanks so much, Professor, for such a deep advice!

Special thanks go to Prof. Florentin Smarandache,[30] Prof. Carlos Castro Perelman, Prof. Matti Pitkannen, Prof. Yu P. Rybakov, Prof. Alexander Yefremov, Prof. Michael Fil'chenkov, and other professors in IGC. And also to Prof. Akira Kanda,

Renata Wong, Dr. Robert Neil Boyd, Dr. Slobodan Nedic, Dr. Volodymyr Krasnoholovrets, Prof. Diego Rapoport, Prof. Liek

28 https://www.buddhanet.net/e-learning/buddhism/pbs2_unit03.htm

29 Milad Hanna, Acceptance of the Other or Otherness, an alternative paradigm of Samuel Huntington. url: http://www.spbric.org/PDF/ttr17.pdf

30 Chair of Dept. Mathematics and Sciences, University of New Mexico, Gallup, USA – this author's best colleague in the past 12 years or so. See the NSIA certificate he gave me at the end of Appendix V.

Wilardjo, Prof. Bambang Hidayat, Prof. Thee Houw Liong, Dr. George Shpenkov, Dr. Paskalis Nyoman Paska, Dr. Gatut Budiyono, Dr. Bambang Noorsena, Mr. Gani Wiyono, Dr. Robbie Chandra, Dr. Yonky Karman, Dr. Joas Adiprasetya, Sergey Ershkov, and so many other physicists who have been corresponding with us in the past few years.

Many thanks also to Sujarwo, Linda, Yunita Umniyati, Susan and many other friends from his childhood, especially thanks to all his friends and teachers in SD/SMP Cor Jesu (mlg), SMAN 3 (mlg), Universitas Brawijaya, Satyabhakti Advanced School of Theology, and Malang Institute of Agriculture (IPM).

And he is also grateful for all fellow Christians in Indonesia and other countries, and also to all members, ministers and sunday school teachers in Gereja Kristen Indonesia.

VC dedicates this paper to Father in Heaven, Jesus Christ, and Holy Spirit for always guiding him through all valley of darkness. Jesus Christ is the Good Shepherd (Ps. 23).

Soli Deo Gloria!

Version 1.0: 17-08-2018, pk. 17:45

Version 1.1: 20-08-2018, pk. 4:45

Victor Christianto

A drunkard theologian, a pedestrian cosmologist, a humble servant of Jesus Christ

CONTENTS

elements in an organization. In other words, this small experiment leads to question the exact role and relevance of utility function in economics theorizing, as McCauley puts it: "the futility of utility."[31]

31 Joseph L. MacCauley. Futility of Utility. Url: https://mpra.ub.uni-muenchen.de/2163/1/MPRA_paper_2163.pdf

We also propose a new theorem called: "Superconductive Olson theorem."

c. On collective emotion and determination

Title: *"A few remarks on how collective emotion and unyielding determination may contribute to a football outcome."* – V. Christianto & F. Smarandache (unpublished paper)

Remark: This article was written around 90 minutes before the match between France and Belgium during semifinal of World Cup 2018 held in Russia, last month. And soon after the paper was uploaded to academia and RG, a few minutes into the second half of the match, Samuel Umtiti made a decisive goal which led France to the final round. This paper emphasizes the role of collective emotion and determination (e.g. grit) in building extraordinary and high performance team.

d. Cellular automaton KdV Universe

Title : *"An outline of cellular automaton universe via cosmological KdV equation."* (V Christianto, F. Smarandache, Y. Umniyati, 2018. J. Phys.: Conf. Ser. 988 012005)

Remark : In this paper, we outline a cellular automaton Universe from cosmological KdV model, which lead to several ultradiscrete models of KdV equations. One of them is formally analogous to Lotka-Volterra model, which has wide application in mathematical biology studies. Does it mean that the Universe can also be modelled in terms of collective dynamics?

Appendixes

PART I

Early work: a small experiment conducted in Moscow streets, May 2009

Title:
"Notes on Utility:
Some Factors which Contribute to Individual Achievement and Plausible Relation to Welfare"

On experimental paper The result that I reported in this paper may be not so clear for common readers, therefore allow me to point out some hints: It is known from any economics textbook that individual pursuit to maximize utility function is a primary tenet in economics study. But what is exactly "utility"? My little experiment with a group of pigeons seem to suggest that the notion of utility does not contribute much to achievements toward wealth. Just like what we observe in management, tangible or monetary benefits are only a factor in workers' satisfaction and happiness. Feeling at home with peers and corporate culture may be a more motivating elements in an organization. In other words, this small experiment leads to question the exact role and relevance of utility function in economics theorizing, as McCauley puts it: "*the futility of utility*".[32]

32 Joseph L. MacCauley. Futility of Utility. Url: https://mpra.ub.uni-muenchen.de/2163/1/MPRA_paper_2163.pdf

NOTES ON UTILITY:

Some Factors which Contribute to Individual Achievement and Plausible Relation to Welfare

V. Christianto
*Sciprint.org administrator
Email: victorchristianto@gmail.com,
admin@sciprint.org Written: 27th Oct. 2009,
ver.1.0, 28th Oct. 2009, ver.1b

Introduction

It is prescribed in economics textbooks that people wants to maximize their utility, and Equilibrium is described as the result of maximizing utility U subject to budget constraint [1]. But the definition of the utility U as a measurable quantity remains not conclusive in literature, see for example discussion by McCauley [1] and Tubaro [3].

Therefore we think that it is more useful to find direct relation between Welfare and actual factors that contribute to individual achievement, rather than relying on nonempirical term of utility. In the present paper, we study a number of factors that contribute to individual achievement, based on small experiment with pigeon sample.

We consider that it is very essential to base economics theory on *measurable quantity* from the beginning, because optimization at individual and aggregate levels is the very hallmark of modern economics theory (Tubaro, 2006, p.1 [3]). That measurable quantity can be observed by virtue of experiment or field observation. Indeed, we think that such an experimental approach is new and original in economics thinking, especially from the view point of *grounded approach*, because after all in studying economics we consider human social behavior and their social interactions. In *grounded approach*, theory building should be based on actual field observation.

We begin with highlight of some basic thoughts on utility U in modern economics literature, and then proceed with experimental result. We draw some sketches on some factors which contribute to wealth achievement based on individual behavior. Implications of this small experiment are discussed briefly throughout the present paper.

The present report is very preliminary in nature, therefore further works are recommended in order to extend further to economics context.

Highlight of modern thinking on Utility

There are extensive literatures on this subject, ranging from mathematical analysis [1], historical study [3], to philosophical consideration [2], but here we limit our review to a few definitions on utility U, highlighting some basic thoughts in modern economics literature, because in this work we would like to emphasize the necessity to study experimentally the direct relation between wealth achievement based on actual factors which contribute to individual achievement. In other words, we would like to find factors which contribute to wealth achievement based on individual behavior.

It is normally prescribed in economics textbooks that people wants to maximize their utility, in other words Wealth is often defined as a function of maximizing utility; and therefore Equilibrium is described as the result of maximizing the utility U subject to budget constraint [1], which yields:

$$p_i = \lambda \frac{\partial U}{\partial x_i}, \quad (1)$$

where λ is a Lagrange multiplier. In other words, it is postulated that a scalar utility function U does exist such that its gradient is assumed to be proportional to the price covector [1, p.8]. While the above proposition is quite analogous to a basic potential equation in physics: p=grad U [1, p.12], the definition of utility U term itself is not clearly defined as a measurable quantity.

But the definition of the utility U as a measurable quantity remains not conclusive as described by McCauley [1], see also Rothbard [2]. In fact, econometrics is based on the *non-empiric* notion of utility [1, p.1].

Furthermore, utility maximization was not clearly related to actual individual achievement; indeed it is merely a normative prescription (i.e. something that people should somehow learn to or conform to), rather than as a possible interpretation of the observed behavior of individuals (Tubaro, 2006, p.5 [3]).

From philosophical consideration, Rothbard [2, p.12] concludes that there is no such thing as total utility; because all utilities are marginal.

Therefore we think it would be more useful to find direct relation between Wealth and actual factors that contribute to individual achievement, rather than relying solely on abstract but non-empirical notion like 'utility'. Nonetheless we should mention that the actual

relation between individual achievement and aggregate result (Welfare) is a very complicated subject and it is beyond the scope of this article.

Experimental Result and Discussion

The present paper is written based on small experiment made by the writer for a few days during study period in last summer (around June 2009). From the experiment, the writer obtains new results which are worthy to be communicated. By feeding a small number of pigeons and changing the location of feeding, we observe some factors which contribute to the individual achievement of the pigeons. These factors correspond to the pigeons activities at given resources. Spatial distribution of resources is found to be very important factor too to the individual achievement.

The assumption in this experiment is that the amount of resources is quite limited if we compare to the amount needed by the pigeons; and the location of feeding is scattered around the pigeons (the feeding is given by throwing it to the pigeons). The exact number of pigeons is not counted. The purpose of this small experiment is to observe qualitatively some factors which affect the individual achievement of the pigeons. The limitation of this experiment is in its serendipity nature, and also we did not carry out the same experiment with other type of animals. Actually this experiment was not planned before hand, but by serendipity during feeding the pigeons on the street, this is why the exact number of pigeons is not counted.

Based on this small experiment, we obtain new finding in the form of a number of factors which contribute to individual achievement of the pigeons, including:

a. The pigeons get the feeding as far as they move with *speed of response. Acceleration* of their speed appears to be very important too and it affects their result.

b. The pigeons get the feeding at the nearest *distance* to them. They tend to neglect the food which is too far from them. This may imply that the pigeons tend to minimize the energy required to get the feeding they need.

c. *(Spatial) distribution* of resources also determines which groups of the pigeons will get more (or less) foods. If the distribution of resources is more evenly, then more pigeons will get equal amount of food. But if the spatial distribution of resources follows normal distribution (*bell shaped*), then the welfare tends to be distributed unequally. The '*sunshine distribution*' can be considered as better spatial distribution to achieve equal welfare.

d. *Cooperation* does not apply to animals, but we can conclude that cooperation is very important for human, because of their social behavior.

e. There are other factors which determine how the pigeons fulfill their needs, such as their eyes, noises, and crowdity (i.e. if there are more pigeons in one small location, then the resources tend to be distributed unevenly).

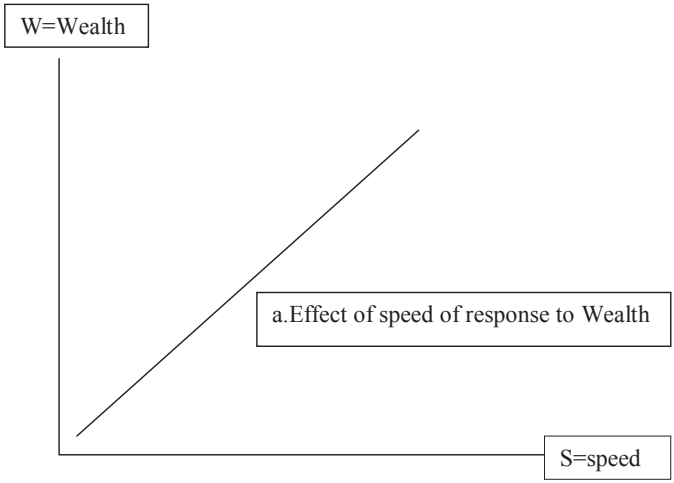
f. Based on this experiment then we can summarize that actually the individual wealth, i.e. based on individual achievement, is a function of speed, acceleration, distance, distribution of resources, cooperation, and other factors. There could be other factors which may be neglected or unobserved in this small experiment. Therefore, we can express Wealth W as function of a number of factors, as follows:

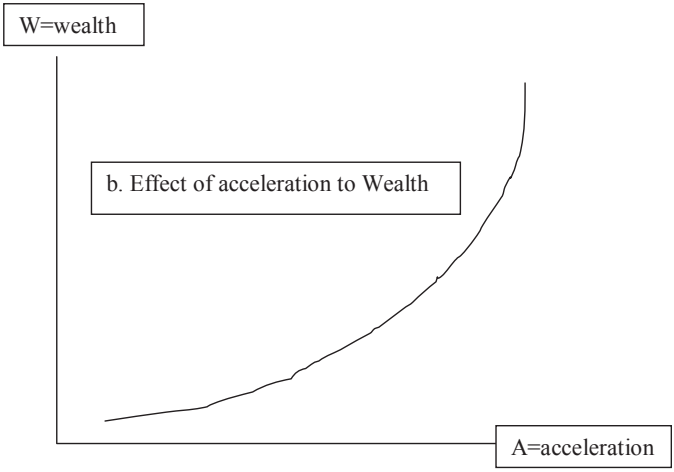
W = f(speed, acceleration, distance, distribution of resource, cooperation, other factors). (2)

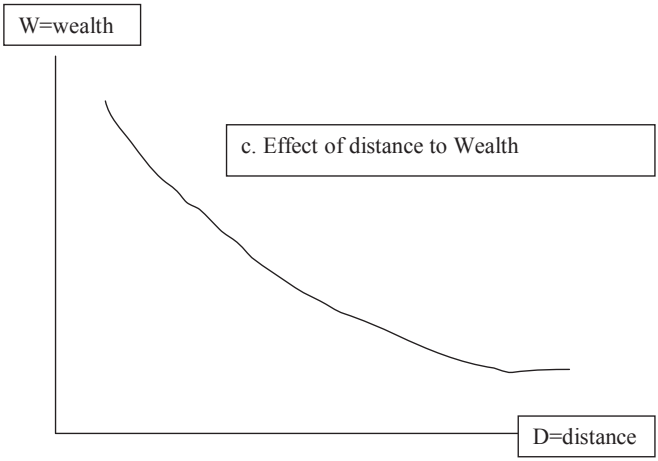
It is our conjecture here that Welfare is the aggregate accumulation of individual achievement to their society. To put it

in simple words: Welfare equals to the average Wealth achieved by a society, i.e. distribution of wealth among the entire society members also determines how well the Welfare is achieved.

The effect of each factor to individual achievement or Wealth (and also Welfare, if we think of the aggregate impact of individual achievement to their society) can be drawn in sketches as follows:







Please note here, that by bell-shape distribution, we mean that distribution of resources is mostly concentrated in small area surrounding the center; therefore the pigeons located in the perimeter (far from the center) cannot access the resources. This type of distribution of resources will make the aggregate welfare less equally distributed among all members, and therefore this type will increase the problems which are caused by inequality.

On the other side, by sunshine distribution, we mean that in order to achieve equal welfare for all society members, resources shall be distributed spatially equal covering all the area, just like the sunshine covers all people in all area in equal amount per square meter. This type of distribution can be difficult to achieve but it will enable all people in perimeter (far from the centre) to access the resources more or less equally.

f. *Effect of other factors* should be determined based on field observation, and the observation should consider specific circumstances and condition. Therefore, the effect of these factors is not sketched here.

There could be other factors which may be neglected or unobserved in this small experiment. There are some questions we leave for further research, including how these factors actually contribute to the wealth of individual member of society and also how it affects the aggregate achievement of society. It would need further works to explore further these questions.

Concluding remarks

In this paper, we describe a number of factors which affect individual achievement based on small experiment with pigeons in the street.

We can conclude that actually Welfare (in aggregate level) is a function of individual achievement. In return, the individual achievement is a function of speed, acceleration, distance, cooperation, distribution of resources, and other factors. To simplify, we can express it as follows:

W = f (speed, acceleration, distance, distribution of resource, cooperation, other factors)

There is limitation of this experiment, including the assumption that individual achievement automatically affects the aggregate results. This assumption is taken as is, and we do not explore it further because it is beyond the scope of this paper. There are other questions we do not explore here, for example how to define price without expressing it as a gradient of utility U. It is possible to think that price actually corresponds to the total possible Welfare which can be created, and this amount is divided by the number of total players.

Cooperation does not apply to animals, but we can conclude that cooperation is very important for human being, because of their social behavior and their ability to interact, communicate and love

each other. There could be other factors which may be neglected or unobserved in this small experiment.

To conclude, the concept of utility shall be re-considered accordingly, see McCauley, 1999 [1]. We agree with McCauley [1, p.2] that Adam Smith's stabilizing hand cannot be found inside the market dynamics itself, i.e. equilibrium cannot be found from internal dynamics. But, in contrary to his pessimistic conclusion, we accept that market nonlinear dynamics can only be stabilized by God's intervention.

This report is very preliminary in nature, therefore further works are recommended in order to extend further to economics context.

Acknowledgement

The writer would like to thank to Jesus Christ who has inspired this article, including the experiment. He always guides the writer throughout his life, including in difficult circumstances. He is the Good Shepherd (Psalm 23).

About the Writer

The writer completed his five year engineering course in 1992, and since then he worked according to engineering profession. After that he continued his career as a webdeveloper until 2008. In his spare time he learned and read some physics and economics literature.

During 2005-2009 he co-authored and edited several books on physics subject in his spare time. The books were written with other scientists. This year he was granted scholarship to take master course in Physics Science from January until June 2009 in PFUR, but did not complete the program. And then by end of June he went back to his country (Indonesia) to continue working. In August 2009 he repented and recently he stopped working as webdeveloper. Now he actively speaks about how Jesus Christ and God love the world; he

loves to tell what Jesus Christ has done with his life, and what Jesus Christ can do with your life too.

The writer is happy to respond phone call or email concerning this subject; you can send your email to victorchristianto@gmail.com.

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[1] McCauley, J.L. (1999) "The futility of utility," arxiv:cond-mat/9911291 (URL: http://arxiv.org/PS_cache/cond-mat/pdf/9911/9911291v3.pdf) [2] Rothbard, M.N., (1956) "Toward a reconstruction of utility and welfare economics," p.9-12, URL: http://mises.org/rothbard/toward.pdf

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PART II

Collective dynamics in psychosynthesis, economics and cosmology

a. Psychosynthesis and socio-economics modelling

Title : *"The World Within Us: (or : A sketch of consciousness space beyond Freudian mental model and implications to socio-economics modeling and integrative cancer therapy)"* – This paper has been submitted to a journal specializing in cancer research.

Remark : In this paper, I gave an outline on how to redefine a consciousness model starting from Matthew 22:37-40, with some implications to socio-economics modelling and also to healthcare.

b. On the potential danger of global eavesdroppers:

Title: *"What we can do to save humanity in the coming era of global eavesdroppers (or The social innovation way to solve collective action problem).*" – accepted in RIEECE/IEEE 2018 conference held in India.

Remark : In this paper I gave an outline of potential problems of global eavesdropper and careless network security, and outline a solution of Mancur Olson's collective action problem. We also propose a new theorem called : "Superconductive Olson theorem."

c. On collective emotion and determination

Title : *"A few remarks on how collective emotion and unyielding determination may contribute to a football outcome."* (unpublished paper)

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d. Cellular automaton KdV Universe

Title : *"An outline of cellular automaton universe via cosmological KdV equation."* (V Christianto et al. 2018. J. Phys.: Conf. Ser. 988 012005)

Remark : In this paper, we outline a cellular automaton Universe from cosmological KdV model, which lead to several ultradiscrete models of KdV equations. One of them is formally analogous to Lotka-Volterra model, which has wide application in mathematical biology studies. Does it mean that the Universe can also be modelled in terms of collective dynamics?

THE WORLD WITHIN US:

(or: A sketch of consciousness space beyond Freudian mental model and implications to socio-economics modeling and integrative cancer therapy)

Victor Christianto*[1] & Florentin Smarandache[2]
[1]Malang Institute of Agriculture (IPM), Malang, Indonesia,
http://researchgate.net/profile/Victor_Christianto
*Email: victorchristianto@gmail.com.
Founder of Second Coming Institute, www.sci4God.com
[2]Dept. Mathematics and Sciences, University of New Mexico, Gallup – USA.
Email: florentin.smarandache@laposte.net

Old pond A frog leaps in
– Sound of the water –

Furu ike ya Kawazu tobi komu Mizu no oto
– Matsuo Baso[33] –

33 https://signature103.blog/2013/04/03/bashos-frog-poem/

Abstract

In this paper, we give an outline of an ongoing study to go beyond Freudian mental archetypal model. First, we discuss the essence of numerous problems that we suffer in our sophisticated and modernized society. Then we discuss possibility to reintroduce spirit into human consciousness. While we are aware that much remain to be done and we admit that this is only a sketch, we hope that this paper will start a fresh approach of research towards more realistic nonlinear consciousness model with wide ranging implications to socio-economics modeling and also integrative cancer therapy. At the last section we also shortly outline plausible method to vindicate our proposed boson-fermion model of human society in a physical experiment.

Introduction

One of us (FS) recently published a new book, with title: Neutropsychic personality.[1] In this book, FS described possible extension of Freudian mental model: id-ego-superego, using his Neutrosophic Logic theory. He goes on to develop implications of this approach.

Later on, we thought that it would be necessary to push the boundary one step further, by considering a more realistic way to go beyond that classic Freudian mental model, i.e. by reintroducing the spirit into human consciousness model.

We are aware that many researchers have proposed such an extension, especially Italian tradition which was continually developed by students of Carl Jung, such as Assagioli and Piere Ferrucci, namely the *Psychosynthesis* movement. See for example [3].

But here we offer a different starting point of mental model, based on Matthew 22, i.e. *The Great Commandments*. As far as we know, i.e. this is the simplest model of human consciousness, yet it is profoundly inspired by the Bible.

This author adopts a rather relaxed approach to present his ideas, with the hope to stimulate both sides of your brain, in order you can realize on how we as human society badly need thoroughly review the present healthcare especially to socio-psychiatry and also to cancer therapy.

A short review of Neutropsychic

One of us (FS) recently published a new book, with title: Neutropsychic personality.[1] In this book, FS described possible extension of Freudian mental model: *id-ego-superego*, using his Neutrosophic Logic theory. His definition of Neutropsychic is as follows:

> "Neutropsyche is the psychological theory that studies the soul or spirit using the neutrosophy and neutrosohic theories. It is based on triadic neutrosophic psychological concepts, procedures, ideas, and theories of the form (<A>, <neutA>, <antiA>), such as (positive, neutral, negative), (good behavior, ignorant behavior, bad behavior), (taking the decision to act, pending, taking the decision not to act), (sensitive, moderate, insensitive), (under-reacting, normally reacting, over-reacting), (under-thinking, normal thinking, over-thinking), and so on, and their refinements as (<Aj>, <neutAj>, <antiAj>)." [1, p.29]

Among other things, he refines the notion of human memory:

"Neutrosophic Memory:

Memory is thus divided into three main parts. It is a symmetric triad of the form (<A>, <neutA>, <antiA>) as in neutrosophy: 1) Conscious, meaning things that we are currently aware of. (It corresponds to <A>.) 2) Unconscious, which comprises things that we are not aware of; they are hard to access because they are deep inside our mind. It is the opposite of conscious. (It corresponds to <antiA>.)

According to Webster Dictionary, unconscious means: "not endowed with consciousness; mindless; [...] (Psychoanalysis) the sum of all thoughts, memories, impulses, desires, feelings, etc. of which the individual is not conscious but which influence the emotions and behavior; that part of one's psyche which comprises repressed material of this nature" (p. 1453). We first cite a Webster definition since it is more objective by comparison with subjective definitions given by biased theorists. Freud [15, 16] has considered the unconscious as a repository for unacceptable desires and ideas by the society, and traumatic memories. 3) Aconscious. We coin now for the first time the concept of "aconscious" (adj.), the "aconscious" (noun), and the derivatives "aconsciousness" (noun) and "aconsciously" (adv.), which etymologically means away from conscious and unconscious, or neither conscious nor unconscious, but in between, or a mixture of conscious and unconscious – a vague buffer zone between them.

Doing a search on American search engine Google (google.com), European search engine Bing (bing.com), and Chinese search engine (baidu.com) for the word "aconscious" on February 15th, 2018, we got no entry. Also, the concept "aconscious" does not exist in English, Latin, Greek

languages – using Google's translation dictionaries. The consciousness, aconsciousness, and unconsciousness are the sources of positive, neutral (or blended), and negative emotions, thoughts, and behaviors throughout our lifespan." [1, p. 37-39]

But here we will not discuss on such a conceptual extension of human memory, instead we will discuss a new conceptual model of human consciousness beyond Freudian mental mode. First of all, let us discuss a basic problem with this modern society.

Problem with this modern society

Our modernized and highly sophisticated society bring numerous advantages over our ancestors, but it is not without consequences. To summarize, we are running anywhere but we find less and less happiness, as it has been pointed long time ago by Albert Einstein. As per records in Caltech, he once spoke:[1]

"Why does this magnificent applied science, which saves work and makes life easier, bring us so *little happiness*? The simple answer is because we have not yet learned to make sensible use of it. In war, it serves that we may poison and mutilate each other. In peace, it has made our lives hurried and uncertain instead of freeing us in great measure from spiritually exhausting labor. It has made men into the slaves of machinery, who for the most part complete their monotonous long days' work with disgust, and must continually tremble for their poor rations. You will be thinking that the old man sings an ugly song. I do it, however, with a good purpose, in order to point out a consequence. It is not enough that you should understand about applied science in order that you may increase man's blessings.

> Concern for man himself and his fate always forms the chief interest of all technical endeavors. Concern for the great unsolved problems of the organization of labor, for the distribution of goods, *in order that the creations of our minds shall be a blessing and not a curse. Never forget this in the midst of your diagrams and equations."* (italic emphasizes by these authors)

Although that speech was translated from German, but the essence remain relevant even for our today's life as scientists, as Harry Gray once remarked:

> "That was Albert Einstein on February 16, 1931, to the Caltech student body, translated by somebody and slightly retranslated by me. -- Obviously, what he said over 40 years ago has relevance to our situation today."[1]

Moreover, we are constantly under pressure in every direction of our life. Perhaps the best sociologist and observer of this heavy burden of life is Queen, a British supergroup from 70-90s era:

Under Pressure

Queen, David Bowie

Mm ba ba de
Um bum ba de
Um bu bu bum da de
Pressure pushing down on me
Pressing down on you no man ask for
Under pressure that brings a building down
Splits a family in two
Puts people on streets
Um ba ba be
Um ba ba be
De day da
Ee day da - that's okay

It's the terror of knowing
What the world is about
Watching some good friends
Screaming 'Let me out'
Pray tomorrow gets me higher
Pressure on people people on streets
Day day de mm hm
Da da da ba ba
Okay Chippin' around -
kick my brains around the floor
These are the days it never rains
but it pours
Ee do ba be
Ee da ba ba ba
Um bo bo
Be lap
People on streets - ee da de da de
People on streets - ee da de da de da de da

It's the terror of knowing
What this world is about
Watching some good friends
Screaming 'Let me out'
Pray tomorrow - gets me higher higher high
Pressure on people people on streets
Turned away from it all like a blind man
Sat on a fence but it don't work
Keep coming up with love but it's so slashed and torn
Why - why - why?
Love love love love love
Insanity laughs under pressure we're breaking
Can't we give ourselves one more chance
Why can't we give love that one more chance
Why can't we give love give love give love give love
Give love give love give love give love give love
'Cause love's such an old fashioned word
And love dares you to care for
The people on the (People on streets) edge of the night
And loves (People on streets) dares you to change our
way of Caring about ourselves
This is our last dance
This is our last dance

This is ourselves
Under pressure
Under pressure Pressure

Songwriters: David Bowie / John Deacon / Brian Harold May /
Freddie Mercury / Roger Taylor
Under Pressure lyrics
© Peermusic Publishing, Sony/
ATV Music Publishing LLC

Now the question is: how can we find out the root cause of this problem of modern society?

Allow us to recall what Adam Grant emphasizes: the basic human motives are selfishness and altruism.

Figure 1. Adam Grant's model of human basic traits

And also we can recall from Genesis 3 that the first fall of our ancestors came from greediness. Now, do you realize: *"How far we have fallen in this modern society, where greed has been hailed as highest virtue?"*

Quoting Grekko's remark: *Greed is good.*

*"The point is, ladies and gentleman, that **greed**, for lack of a better word, is good. **Greed** is right, **greed** works. **Greed** clarifies, cuts through, and captures the essence of the evolutionary spirit. **Greed**, in all of its forms; greed for life, for money, for love, knowledge has marked the upward surge of mankind."*[34]

We consider this is the true core of our modern reality, all of us have been consumed and drowning in the ocean of greediness. The real irony is that greediness has eaten us alive, from our childhood until we die. Even if we once die, there are those greed developers who sell a piece of cemetery with high price. They capitalize our bodies, our eyes, our jealousy, our heart, our mind, our consciousness. Literally speaking, we are more or less as *walking zombies*. We are getting improved at the outside, but we are no more than *rotten tomatoes* deep inside.

At this point, some may ask: How can we repair such a deep problem of our modern society?

Outline of reasoning: Toward Pneumatological view of psychology

We all know that Hebrew's thought on human being is integral, i.e. the whole of body-mind-spirit. But how can we come up with a model of human consciousness based on the Bible?

As a starting point, we choose to begin with Jesus's sayings, instead of using other trivial sources.

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34 The Wall Street (1987). url: https://businessethicsblog.com/2010/10/12/wall-street-1987-greed-is-good/

Let us begin by the Greatest Commandment

Matthew 22:37-40 King James Version (KJV)

37 Jesus said unto him, Thou shalt love the Lord thy God with all thy heart, and with all thy soul, and with all thy mind.

38 This is the first and great commandment.

39 And the second is like unto it, Thou shalt love thy neighbour as thyself.

40 On these two commandments hang all the law and the prophets.

Our re-reading of the above commandments lead us to model a Trinitarian dialogue within human self: God, self, and others.[35]

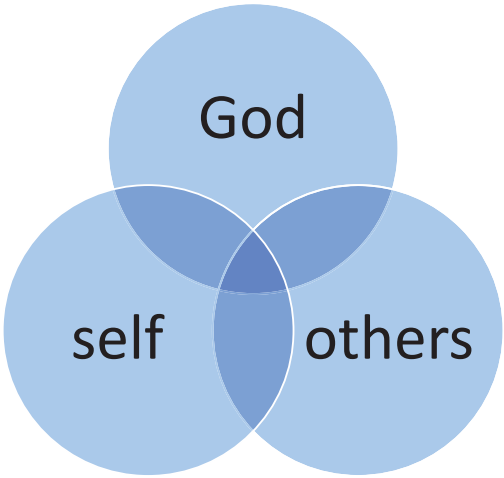

Figure 2. Three directions of human love based on The Greatest Commandments in Matthew 22:37-40.

35 For an alternative reading of Mat. 22, see Vern Poythress's article: https://frame-poythress.org/the-greatest-commandment-the-very-heart-of-the-matter/

Comparing with Adam Grant's give and take model of human basic tensions inside our mind. Let us consider parallels, i.e. "*taking*" reflects selfishness/greediness motive of ego, and "*giving*" reflects altruism motive of conscience.

In other word, now we have two entities in human consciousness: ego and conscience. There is always deep tension between ego and consciousness, between selfishness and altruism. Along these two poles, we need a third entity which has purpose to ease and being intermediary between these two motives. In this problem, along with *Neutrosophic Logic*, allow us to submit wholeheartedly that the third entity, is actually no other than "the spirit." (*pneuma* in Greek, *ruach* in Hebrew)

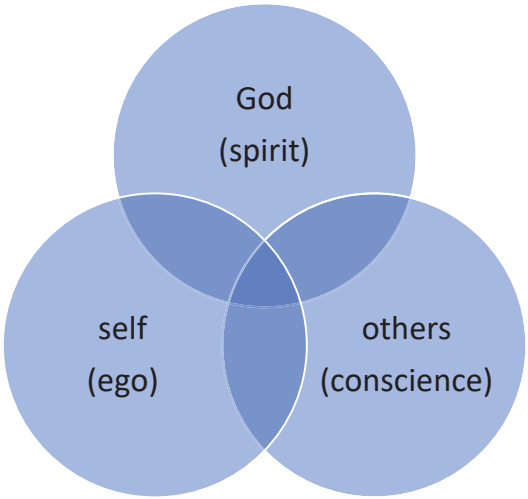

Figure 3. A model of human consciousness based on The Greatest Commandments in Matthew 22:37-40.[36]

36 This model may be compared to Jung's personality model, which includes individual unconscious and collective unconscious. (see Prof. Thee Houw Liong's added note in preface.)

The exact role of human spirit is to enlighten both ego and conscience. While some may raise question of what is new here? It seems similar with id-ego-superego model.

No, it is really in contrast with Freud's model which is purely materialistic in origin. The notion of spirit is rejected in freud model, that is why mankind reduces to animals in his model, determined by his/her sexual instinct. And there is no way out of such animal instinct in his model.

Sometimes it is called transpersonal psychology:

> *"**Transpersonal psychology** is a sub-field or "school" of **psychology** that **integrates** the spiritual and transcendent aspects of the human experience with the framework of modern **psychology**. It is also possible to **define** it as a "**spiritual psychology**".*

An interesting argument spiritual psychology has been discussed in Santa Monica site:

> *"If you look up the word "psyche" in the dictionary, you will find "breath, principle of life, Soul." But if you look up "psychology," you will find "the science of mind and behavior." Somehow, in the translation from essence to practice, the most important aspect of "psyche" has been lost. At the University of Santa Monica, we recognize our task as reintegrating the spiritual dimension back into the essence of an authentic psychological inquiry. It is this reintegration that evokes the emergence of a Spiritual Psychology.*
>
> *Spiritual Psychology is the study and practice of the art and science of Conscious Awakening. To engage in this genre, we must begin by distinguishing the essence*

of human evolution—what does it mean to evolve? In short, it means learning how to identify, recognize, and navigate successfully within the Context of Spiritual Reality. Practically, it means learning how to surrender—or let go of—anything that disturbs one's peace. It also means sacrificing our illusions of separation. Essentially, this "surrendering" and "sacrificing" is work that can and has been called "healing," which includes healing on the physical, mental, and emotional levels in service to the deeper revelation of who we truly are as Loving, Peaceful, Compassionate, and Joyful beings. We refer to this level of awareness as the Authentic Self."

Of course, there are various approaches of spiritual psychology. But, what is really different in our simpler model?

Two possible implications: a) in socio-economics model

In this time we would only discuss the economics implications, based on modelling human identities into two opposites: (a) individualism (we call them: fermions), and (b) collectivism (we call them: bosons).

In a recent paper, we discuss how to solve Mancur Olson's collective action problem [2].

Now, some of you may ask: by suggesting solution to Olson's collective action problem to save our humanity, where is the article heading? Are we advocating collective society as in old day Marxism hammer? Or are we advocating how to escape from the curse of capitalism's social darwinism?[37]

37 See for example Richard Hofstadter: Social Darwinism in American thought. url: http://culturism.us/booksummaries/SocialDarwinismHofst.pdf

Yes, normally you read numerous political-economics jargons, e.g. leftist, right wing, centrist left or centrist right and so on.

But it is not our intention to submit another ideological parlance. In fact, these authors are scientist and mathematician, so we are not so inclined to any parlance.

In our opinion, our tendency to cooperate or compete is partly influenced by the culture that we inherit from our ancestors. One of us (VC) once lived for a while in Russia, and he found that many people there are rather cold and distant (of course not all of them, some are friendly). He learned that such a trait is quite common in many countries in Europe. They tend to be individual and keep a distant to each other. In physics term, they are like *fermions*.[38]

There is a developmental psychology hypothesis that suggests that perhaps such a trait correlates to the fact that many children in Europe lack nurtures and human touch from their parents, which make them rather cold and individual. Of course, whether this is true correlation, it should be verified.

On the contrary, most people in Asia are gregariously groupie (except perhaps in big metropolitans). They tend to spend much time

38 While our proposed simplifying analogy of human behaviour, i.e. individualism and collectivism sound not so common. Indeed such cultural psychology research has been reported since Harry C. Triandis et al. See for example: (a) The Self and Social Behavior in Differing Cultural Contexts, Psychological Review, vol. 96 no. 3; (b) Harry C. Triandis and Eunkook M. Suh, CULTURAL INFLUENCES ON PERSONALITY, Annu. Rev. Psychol. 2002. 53:133–60; (c) J. Allik & A. Realo, Individualism-collectivism and social capital, JOURNAL OF CROSS-CULTURAL PSYCHOLOGY, Vol. 35 No. 1, January 2004, 29-49. This last mentioned paper includes a quote from Emile Durkheim: "The question that has been the starting point for our study has been that of the connection between the individual personality and social solidarity. How does it come about that the individual, whilst becoming more autonomous, depends ever more closely upon society? How can he become at the same time more of an individual and yet more linked to society?"

with family and friends, just like many Italians. They attend religious rituals regularly, and so on. In physics term, they are bosons. Of course, this sweeping generalization may be oversimplifying.[39]

Therefore, it seems quite natural to us, why Adam Smith wrote a philosophy book suggesting that individual achievement is a key to national welfare (because he was a British which emphasized individualism).[40] It took more than hundred years until mathematicians like John F. Nash, Jr. figured it out that individual pursuit toward their own goals will not lead them to achieve a common goal as society.[41]

That is why, we choose to work out Mancur Olson's theorem, because he is able to condense the complicated game theoretical reasoning (whether one should cooperate or not) into a matter of collective actions.

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39 After writing up this article, we found that Sergey Rashkovskiy also wrote a quite similar theme, albeit with a statistical mechanics in mind. The title of his recent paper is: "'Bosons' and 'fermions' in social and economic systems." Here is abstract from his paper: "We analyze social and economic systems with a hierarchical structure and show that for such systems, it is possible to construct thermostatistics, based on the intermediate Gentile statistics. We show that in social and economic hierarchical systems there are elements that obey the Fermi-Dirac statistics and can be called fermions, as well as elements that are approximately subject to Bose-Einstein statistics and can be called bosons. We derive the first and second laws of thermodynamics for the considered economic system and show that such concepts as temperature, pressure and financial potential (which is an analogue of the chemical potential in thermodynamics) that characterize the state of the economic system as a whole, can be introduced for economic systems." Url: https://arxiv.org/ftp/arxiv/papers/1805/1805.05327.pdf

40 If only Adam Smith was born in Bangkok or Manila, probably he wrote his book in a different way.

41 Imagine 10 players of a football team go simultaneously to make a goal to their opposite team, will they succeed? Of course no, they should arrange according to their coach's instruction: 1-4-4-2, or other type of arrangement.

So, which is better: *to be like fermions or bosons?* Our opinion is: just like in particle physics, both fermions and bosons are required. In the same way, fermion behavior and boson behavior are both needed to advance the quality of life. Fermion people tend to strive toward human progress, while boson people are those who make us alive. Just like an old song: *Ebony and Ivory*….they make harmony in society.[42]

We hope this paper helps us to see that collective actions are what made us a human society.[43] And it seems related to social *innovations* and also social *capital* too, in other words a society with social capital and collective actions will ensure its sustainable future.[44] But this is beyond the scope of this article, let us leave such a discussion to economists.

So, by introducing this analogy from particle physics theories, we hope to resolve the classic clash between socialism and capitalism, which are no other than a cruel reformulation of the above basic human motives into political struggles, in attempt to put the entire mankind into eternal slavery.

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42 While we are fully aware that politically speaking, Marxism and capitalism are irreconcilable, recent studies indicate that there are possible intermediate states between these two, such as The Third way in Tony Blair's era, welfare states in most European countries, various cooperative systems in Scandinavian countries, state-driven capitalism in Vietnam and China, Japan inc. etc. In other words, from Neutrosophic perspective, dialogues between human tensions of individualism and collectivism remain open for future economics theorizing toward a much better and improved quality of life, while at the same time we ought to remove the dialectical clashes a la Huntington's NWO

43 In our country, there is a specific phrase for some people who work together to achieve a common goal: "*gotong royong*."

44 Emily Ouma & Awudu Abdulai. Contributions of Social Capital Theory in Predicting Collective Action Behavior among Livestock Keeping Communities in Kenya. url: https://ageconsearch.umn.edu/bitstream/49994/2/Manuscript%20No.%20423_Social%20capital%20theory%20and%20collective%20action.pdf

Too many decades have been wasted by numerous countries to fight on these ideologies, but the truth is these opposite ideological poles were crafted in order to trap mankind into eternal struggles.[45] It needs to be stopped right now.

In Appendix I of this paper, the author gives a reflection on how we should slow down our pace, to become in tune with the speed of love, i.e. the speed of Jesus Christ: 3 mile-an-hour (cf. Kosuke Koyama).

Two possible implications: b) integrative cancer therapy

In this time we would only give a rough sketch of our ideas in cancer therapy, based on the aforementioned: *Pneumatological approach to psychology*.

In the light of the fact that proper discussion of theology of medicine is quite rare, this section highlights the fundamental problem with modern (Western) medicine. China has taken a step forward by recognizing their cultural heritage called TCM. Of course it must be acknowledged that modern (Western) medicine has been very advanced, but also many problems such as side effects and also many toxic materials due to synthetic materials. It is also well known that chemotherapy has a chance to work at a miserable rate of less than 20%, so it is reasonable to argue that the 21st century requires a conceptual, new approach to treatment.

A few months ago, a respected senior professor of physics in Indonesia, Prof. Dr. Bambang Hidayat, a member of the Indonesian Academy of Sciences, sent an article to a group of academics. In essence he asked: how our response should be to China's recent

45 Some authors wrote that such crafted political struggles only gave monetary advantages to those greedy financial institutions, by selling weapons to both sides of parties. See for instance a very good movie: The International

policies that want to facilitate the practice of treatment based on TCM (traditional Chinese Medicine) in a balanced way.

His concern is certainly understandable, given the current perception of society is that traditional medicine, often referred to as alternative medicine, is usually associated with shamanic practices or strange methods such as turtles, snakes, bruises etc., many of which have not passed any clinical trials.

But there are two important things that we should take note of Xi Jinping's new policy on TCM:

a. This policy starts from realizing that the cost of Western medicine is very expensive, mainly due to clinical trials of humans, so it is quite reasonable that the Chinese government wants to give more balanced attention to the Chinese medicine tradition.

b. Traditional Chinese medicine has grown for no less than 4000 years.

   However, we shall also note that there are some reports that in Asia, liver cancer can be linked to the use of (excessive) herbal medicines. Of course this needs further study. (5)

Regarding some people's concerns about the removal of clinical trials, it seems the Chinese government is quite cautious, see the following quote:

> *"Lixing Lao, director of Hong Kong University's School of Chinese Medicine, says that although traditional medicines will no longer need to go through clinical trials, the CFDA will still require remedies to undergo preclinical pharmacological testing and drug-toxicity studies in animals or cells to gain approval."(2)*

Certainly it can be expected that the new policy will further strengthen the interest of people to develop and produce drugs based

on herbs that have been known to be useful for thousands of years, rather than synthetic (artificial) substances that could potentially not be processed and become toxic.) (4)

In Indonesia, it is also known a variety of medicinal plants, and there are several apps that provide catalog of such live pharmacies. One of which can be called for example is gendola, which reportedly efficacious for diabetes, cancer, stroke, coronary heart, liver etc. Of course clinical trials are required for this gendola. (6)

The fundamental problem of modern medicine (Western)

There are several scientific authors who express vividly how fundamental the problem with modern (Western) medicine. The fundamental problem is commonly expressed with a mechanistic worldview as well as a Cartesian dualism philosophy. [8][19].

Sheldrake has revealed that the mechanistic view is actually derived from Neo-Platonic philosophy, so it is not based on biblical teaching.

A similar argument was developed by Fritjof Capra in his famous book, *The Turning Point*.[15] In rather similar tone, Christian philosopher *Alvin Plantinga* has written a paper criticizing materialism. [19]

Unfortunately, however, the thinking of scientists from such disciplines often fails in the midst of massive dis-information (and advertising) that modern (Western) medicine has managed to address almost all human health problems. Is that true?

Let's take a look at the colonial post-reading of Gen. 2: 7 and some other texts.

The post-colonial reading of Gen. 2: 7

If we glance at Gen. 2: 7, we see at a glance that man is made up of the dust of the ground (*adamah*) which is breathed by the

breath of life by God (*nephesh*). Here we can ask, does this text really support the Cartesian dualism view?

We do not think so, because the Hebrew concept of man and life is integral. The bottom line: it is not the spirit trapped in the body (Platonic), but the body is flowing in the ocean of spirit. [16] This means that we must think of as an open possibility for developing an integral treatment approach (Ken Wilber), or perhaps more properly called **"spirit-filled medicine"**.

Let's look at three more texts:

a. Gen. 1: 2, "The earth is without form and void, darkness over the deep, and the Spirit of God hovering over the waters." Patterns such as Adam's creation can also be encountered in the creation story of the universe. Earth and the oceans already exist (similar to adamah), but still empty and formless. Then the Spirit of God hovered over it, in the original text *"ruach"* can be interpreted as a strong wind (storm). So we can imagine there is wind/hurricane, then in the storm that God said, and there was the creation of the universe. From a scientific point of view, it is well known in aerodynamics that turbulence can cause sound (turbulence-generated sound). And primordial sound waves are indeed observed by astronomers.

b. Ps. 107: 25, "He said, he raised up a storm that lifted up his waves." The relation between the word (sound) and the storm (turbulence) is interactive. Which one can cause other. That is, God can speak and then storms, or the Spirit of God causes a storm. Then came the voice.

c. Ezekiel. 37: 7, "Then I prophesy as I am commanded, and as soon as I prophesy, it sounds, indeed, a crackling sound, and the bones meet with one another." In Ezekiel it appears that the story of the creation of Adam is repeated, that the Spirit of God is blowing (storm), then the sound of the dead bones arises.

The conclusion of the three verses above seems to be that man is made up of adamah which is animated by the breath or Spirit of God. He is not matter, more accurately referred to as spirit in matter. Like a popular song around 80s goes: "*We are spirits in the material world*." See also Amos Yong [14]. Therefore, it is inappropriate to develop only materialistic or Cartesian dualism treatment. We can develop a more integral new approach. [8]

The integral view of humanity and spirituality, instead of two-tiered Western view of the world, appears to be more in line with majority of people in underdeveloping countries, especially in Asia and Africa. See for instance the work by Paul Hiebert [21].

Among the studies supporting such an integral approach is the view that cells are waves, see the paper from Prof. Luc Montagnier. [20]. And also our paper on the wave nature of matter, as well as the possibility of developing a wave-based (cancer) treatment.[23][24][46]

Concluding remarks

In this paper, we give an outline of an ongoing study to go beyond Freudian consciousness model. First, we review a recent book by our colleague, FS. Neutropsychology. Then we discuss possibility to reintroduce spirit into human consciousness. While we are aware that much remain to be done and we admit that this is only a sketch, we hope that this paper will start a fresh approach of research towards Pneumatological view of psychology in a realistic nonlinear consciousness space view.

This short article also highlights the fundamental problem with modern (Western) medicine. China has taken a step forward by recognizing their cultural heritage called TCM. Of course it must

46 Our paper on non-particle view of DNA was once presented at the 2016 ICTAP conference in Makassar in 2016 by my long time co-author, Dr. Yunita Umniyati.

be acknowledged that modern (Western) medicine has been very advanced, but also many problems such as side effects and also many toxic materials due to synthetic materials. It is also well known that chemotherapy has a chance to work for less than 20%, so it is reasonable to argue that the 21st century requires a conceptual, new approach to treatment.

Message to young readers:

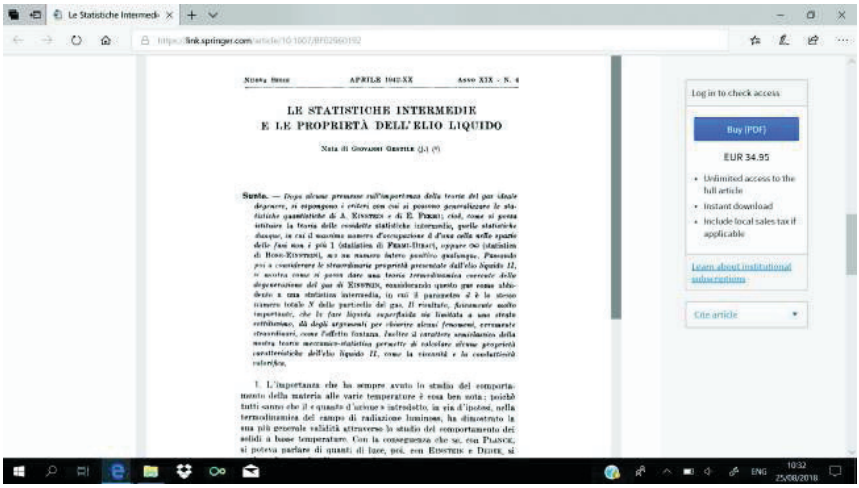
We hope this short article may inspire younger generation of physicists and biologists to rethink and renew their approaches to Nature, and perhaps it may also help to generate new theories which will be useful for a better future of mankind.

Postscript:

A. A short note on plausibility of experimental vindication of the proposed model

These authors just think of plausible vindication of the proposed intermediate state of fermion-boson, which may be called "ferson". It may have a chance to get into real observation at CERN etc. It may be indeed interesting for particle physicists who wish to continue the service period of CERN expensive facilities after discovery of Higgs particle. As the readers may already know, they tried to extend standard model to supersymmetry but it failed to come to detectors. Meanwhile, we just read that there are two possible theories which seem correspond to an intermediate statistics we're looking for: (1) anyon fractional statistics by Franck Wilczek, which we are not sure, (2) G. Gentile's statistics which predict the existence of "intermediate particle" between fermion and boson, but nobody has identified any experiment with such an intermediate particle so far. So, allow us

to suggest interested readers to read and examine Giovani Gentile's original paper in *Nuovo Cimento* (1941).[47]



Picture 1: Screenshot of first page of G. Gentile's paper (1941)

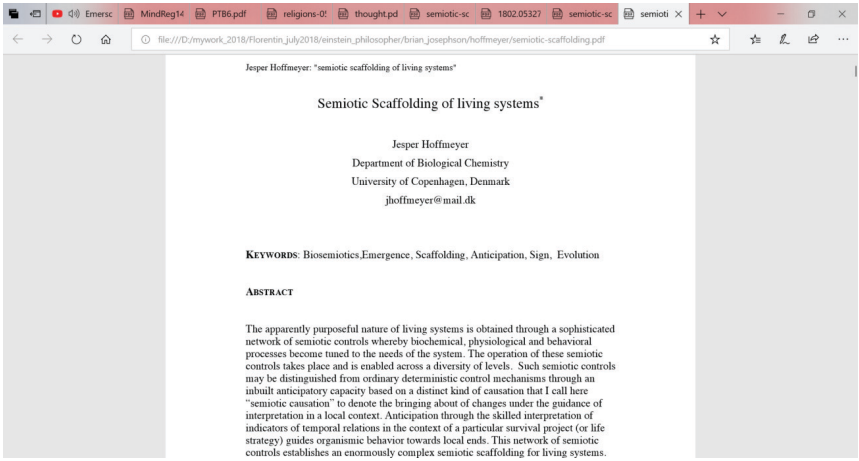
We also plan to write up a short speculative paper on this topic, perhaps with title like: "On possible detection of intermediate state of fermion-boson particle from Klein-Bottle physics." But of course, this topic is to be discussed in other paper.

B. Toward Pneumatological Mind-Matter Interaction.

Various models have been proposed to suggest possibility of mind-matterinteraction, but mostly fall within QM theory. Other experiments seem to suggest that the effect is quite real, albeit many aspects remain mystery.

47 See his short biography: https://www.luisabonolis.it/Giovanni_Gentile_Jr_files/GentileCronoFoto.pdf

There are vast amount of mind-matter interaction models of living systems, from Stuart Hameroff etc's model, Semiotic Scaffolding model of Jesper Hoffmeyer (which Brian Josephson suggests a new term: Semiophysics) etc. See for instance [26-28].



Jesper Hoffmeyer: "semiotic scaffolding of living systems"

Semiotic Scaffolding of living systems*

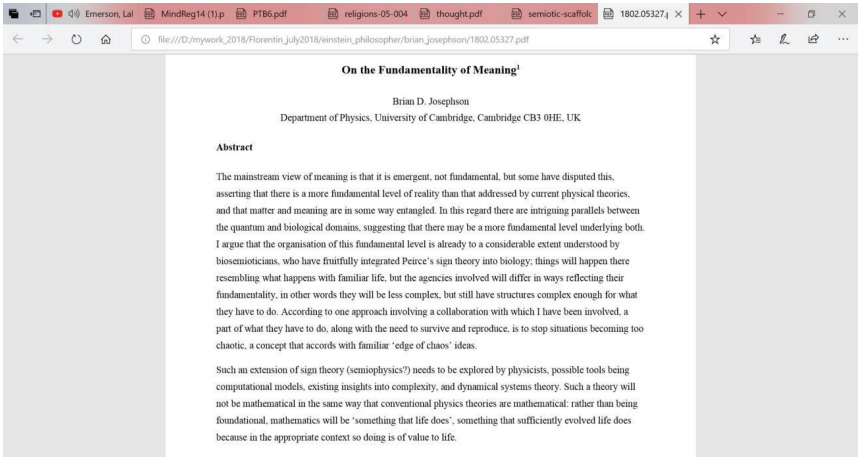
Jesper Hoffmeyer
Department of Biological Chemistry
University of Copenhagen, Denmark
jhoffmeyer@mail.dk

KEYWORDS: Biosemiotics,Emergence, Scaffolding, Anticipation, Sign, Evolution

ABSTRACT

The apparently purposeful nature of living systems is obtained through a sophisticated network of semiotic controls whereby biochemical, physiological and behavioral processes become tuned to the needs of the system. The operation of these semiotic controls takes place and is enabled across a diversity of levels. Such semiotic controls may be distinguished from ordinary deterministic control mechanisms through an inbuilt anticipatory capacity based on a distinct kind of causation that I call here "semiotic causation" to denote the bringing about of changes under the guidance of interpretation in a local context. Anticipation through the skilled interpretation of indicators of temporal relations in the context of a particular survival project (or life strategy) guides organismic behavior towards local ends. This network of semiotic controls establishes an enormously complex semiotic scaffolding for living systems.

Picture 2. Hoffmeyer's first page of his paper: *Semiotic Scaffolding of living systems.* [26]



On the Fundamentality of Meaning[1]

Brian D. Josephson
Department of Physics, University of Cambridge, Cambridge CB3 0HE, UK

Abstract

The mainstream view of meaning is that it is emergent, not fundamental, but some have disputed this, asserting that there is a more fundamental level of reality than that addressed by current physical theories, and that matter and meaning are in some way entangled. In this regard there are intriguing parallels between the quantum and biological domains, suggesting that there may be a more fundamental level underlying both. I argue that the organisation of this fundamental level is already to a considerable extent understood by biosemioticians, who have fruitfully integrated Peirce's sign theory into biology; things will happen there resembling what happens with familiar life, but the agencies involved will differ in ways reflecting their fundamentality, in other words they will be less complex, but still have structures complex enough for what they have to do. According to one approach involving a collaboration with which I have been involved, a part of what they have to do, along with the need to survive and reproduce, is to stop situations becoming too chaotic, a concept that accords with familiar 'edge of chaos' ideas.

Such an extension of sign theory (semiophysics?) needs to be explored by physicists, possible tools being computational models, existing insights into complexity, and dynamical systems theory. Such a theory will not be mathematical in the same way that conventional physics theories are mathematical: rather than being foundational, mathematics will be 'something that life does', something that sufficiently evolved life does because in the appropriate context so doing is of value to life.

Picture 3: Prof. Brian Josephson's first page of his paper [27]

But we prefer to suggest a simpler model based on the fact observed by Benveniste and also later by Maxim Trushin:[48] there is a kind of antenna or *sonic-mediated communication* between cells.[49] Therefore, we submit a model of mind-matter interaction by a new term: Pneumatological cymatic mechanism, i.e. by the human voice, soaked in the Holy Spirit, then it may affect the material/environment. Nonetheless, we admit that the exact mechanism of Pneumatological mind-matter interaction remains mystery, and this topic is reserved for future research. What we can say for now is: it seems the effect of mind-matter effect over long distance (more than 150km) has been reported, which suggests that this topic is very interesting for next research. [29].

(See also our previous papers on theo-cymatic view cosmology, in Part III).

Acknowledgement

This paper is inspired partly by Prof. Adam Grant's deep and insightful book: Give and Take. VC gratefully appreciates Elizabeth and Sujarwo in Jkt. Thanks so much for spending many years of being trustful friends and being sparring partners in such uneasy intellectual endeavor like this. He is also deeply grateful to his parents for showing the way through their life on how to walk in 3-mile-an-hour speed with God. Special thanks to Prof. Dr. Bambang Hidayat, a member of the Indonesian Academy of Sciences, for sending Nature News article on TCM (Appendix II). VC dedicates this paper to Father in Heaven, Jesus Christ, and Holy Spirit for always guiding him through all valley of darkness. Jesus Christ is the Good Shepherd (Ps. 23).

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Version 1.0: 20th July 2018, pk. 19:30

Version 1.1: 5th Aug 2018, pk. 19:45

Version 1.2: 20th aug 2018, pk. 5:21

Version 1.3: 21th aug 2018, pk. 11:15

Version 1.4: 21th aug 2018, pk. 15:37

Version 1.5: 25th Aug. 2018, pk. 10:44

VC & FS

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Appendix I: 3 mile-an-hour God and the speed of LOVE

Victor Christianto, Founder of The Second Coming Institute

Shalom, all brothers and sisters in Jesus Christ. Do you realize that our life can be summarized in one word: faster.

Anything we do, we do that faster and faster. Read fast. Eat fast. Speak fast. Walk fast. Drive fast. Pray fast. And so on.

Sometimes we forget that God want to walk with us at 3 mile an hour speed. As a Christian blogger wrote recently:(1)

John 9:1 says, "As he passed by, Jesus saw a man blind from birth." What if he was driving, running, or in a hurry? Instead, Jesus moved with a pace at which he could "see." He saw the man. He saw his need and he had compassion.

A Japanese theologian named Kosuke Koyama wrote a book called Three Mile an Hour God. In it he wrote:

> *"Love has its speed. It is a different kind of speed from the technological speed to which we are accustomed. It goes on in the depth of life at 3 miles per hour. It is the speed we walk and therefore the speed the love of God walks."*

Jesus walks at the speed of love. He's our 3 mile-an-hour Savior. And he sees you. He sees your secrets and baggage, your pain and fear. He sees death and dung, and still chooses to walk among us. To forgive, to heal, to help.

Would you adjust your pace? Would you slow down so that you can "see"? See God's work in the world. See how you might join in on what He's doing. See the people around you. Know their needs. How can we be unhurried, undistracted, and attentive to the world around us?

Go for a walk.

Sit on your front step in the evening.

Redefine how you use electronic devices.

Remove a few unnecessary items from your crowded calendar.

Set aside a few quiet moments every day to read God's word. To commune with him in prayer.

"As he passed by..." Jesus sees you. He's your 3 mile-an-hour Savior.

Here is a story of a man who chooses to walk for Jesus, and people whom he met along his walk:

William C.Heller Jr.6/21/2018 05:32:24 pm

This is my brief true story of a time in my life when I took a walk for Jesus.This journey began at highway 55 and Butler Hill road. I began walking up the ramp and praying to God this prayer. God you know I cannot walk to where ever you wish me to go. Would you please send me a ride and the person you desire me to talk to. Half way up the ramp a young man of college age stopped and offered me a ride.He then began to tell me all about his life and the church he attended which is the First Baptist church Of Festus.

The next thing he told me is how he was worried about his final exams in college. I told him how I once had to take my exams for my GED and asked God to help me take the test and that help came in the sense of calmness.The next thing I said to this young man was, You go to church, Have you asked God for any help in your life? He looked at me as if he new what to do next. By this time he was pulling off the side of the road right in front of the First Baptist Church which sits on the side of the highway. As I got out of his car he thanked me for my help. there was now a calm about him as well.

I sat on the guard rail for no more than fifteen minutes and began to walk as I prayed once more the same prayer as before. Right away I heard air brakes on a truck behind me and looked back as this man was only a few feet

away and motioned for me to get into his truck. I am John Murdock a dairy driver from Madison, Wisconsin. I said my name is William Heller and I am walking for Jesus. He then told me about a young lady he had met on the road the week before doing the same thing. John would ask me about all things he had questions about the Bible. As he made his deliveries for the day and the day ended he invited me to stay with him and he bought me dinner and breakfast. I spent three days with John and he left me off on Highway 75 leading down to Atlanta. His last words were, I going to go home and read my Bible this weekend. This is only a small part of my walk for Jesus.If you like to hear more let your fingers do the walking and write me.

My prayer in this sunday morning (22/7/2018, pk. 7:23)

"Jesus, forgive me for trying to do things faster and faster. Meanwhile, teach me to learn how to walk and work and talk and pray at a lower speed. Teach me to meet and greet people whom I see along the walk. Thank you for Your forgiveness and patience on me. Amen."

Versi 1.0: 22 july 2018, pk. 7:24 Victor Christianto,
Founder of The Second Coming Institute

Reference:

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Appendix II: Nature News, 30 november 2017[50]

China to roll back regulations for traditional medicine despite safety concerns

Article by David Gray from Reuters

Scientists fear plans to abandon clinical trials of centuries-old remedies will put people at risk. ---

The Chinese government is promoting traditional Chinese medicines as an alternative to expensive Western drugs.

Support for traditional medicine in China goes right to the top. President Xi Jinping has called this type of medicine a "gem" of the country's scientific heritage and promised to give alternative therapies and Western drugs equal government support. Now the country is taking dramatic steps to promote these cures even as researchers raise concerns about such treatments.

From early next year, traditional Chinese medicines may no longer be required to pass safety and efficacy trials in humans in China. Draft regulations announced in October by the China Food and Drug Administration (CFDA) mean traditional medicines can skip such costly and time-consuming trials as long as manufacturers prepare ingredients using essentially the same method as in classic Chinese formulations. The State Administration of Traditional Chinese Medicine and the CFDA will compose a list of the approved methods.

The Chinese government has been forcefully promoting traditional Chinese medicines (TCMs) as an alternative to expensive Western drugs. Doctors of Chinese medicine have welcomed the new policy, saying that it will make it easier for companies who produce

50 Special thanks to Prof. Dr. Bambang Hidayat for sending this article.

such medicines to get drugs approved and make them available to patients. Lixing Lao, director of Hong Kong University's School of Chinese Medicine, says that although traditional medicines will no longer need to go through clinical trials, the CFDA will still require remedies to undergo preclinical pharmacological testing and drug-toxicity studies in animals or cells to gain approval.

Safety concerns

But scientists say that safety concerns continue to plague the industry, and that minimizing clinical-trial requirements could put more patients at risk. On 23 September, the CFDA recalled batches of two injectable TCMs after about ten people fell ill with fevers and chills.

Less than a month later, on 18 October, researchers in Singapore and Taiwan published a study in Science Translational Medicine linking liver cancer to aristolochic acid, an ingredient widely used in traditional remedies1. Lead author Steven Rozen, a cancer-genomics researcher at Duke-NUS Medical School in Singapore, is convinced that aristolochic acid contributed to the mutations, but says it's harder to determine to what extent it caused the tumours. Aristolochic acid has also been linked to cancers of the urinary tract and can cause fatal kidney damage2, 3. Rozen says it is still in common use, despite warnings from the US Food and Drug Administration that it is associated with kidney disease. "It would be a good time to reassess regulations" of aristolochic acid, he says.

Lao sees people take remedies containing aristolochic acid every day, and says it should not cause problems if taken "moderately and to treat diseases" rather than as a regular supplement. He says more research is needed into how to ensure the safe use of the potentially toxic substance. Overall, Lao is not concerned about safety issues with traditional medicines because, "unlike Western drug development,

these herbal formulas have been used for hundreds and thousands of years," he says.

But Li Qingchen, a paediatric surgeon at the Harbin Children's Hospital and a well-known critic of TCMs, says the recent recalls of remedies show that current safety measures aren't adequate. He says doctors need to inform the public about some of the dangers associated with traditional medicines, but that most are unwilling to speak out against them. "Few doctors would dare to publicly criticize TCMs," he says. Li thinks that the government's promotion of TCMs will make it harder for scientists to criticize the drugs "because the matter gets escalated to a political level and open discussions become restricted".

Criticism muted

With strong government support for the alternative medicines industry, Chinese censors have been quick to remove posts from the Internet that question its efficacy. On 23 October, an article on a medical news site that called for closer attention to the risks of aristolochic acid was removed from social media site WeChat. The story had been viewed more than 700,000 times in three days.

Debate over TCMs has been silenced before in China. Last year, a Beijing think tank — the Development Research Center of the State Council — proposed banning the practice of extracting Asiatic black bear bile, another common ingredient in TCMs. The think tank's report questioned the remedy's efficacy and suggested using synthetic alternatives. It was removed from the think tank's website after the Chinese Association of Traditional Chinese Medicine, which supports the development of TCM, called it biased and demanded an apology.

As well as reducing regulations for TCMs, the Chinese government has made it easier to become a doctor of traditional medicine and

to open hospitals that use the approach. Since July 2017, students studying traditional medicine no longer need to pass the national medical exams based on Western medicine. Instead, traditional medicine students can attend apprenticeship training and pass a skills test. And practitioners who want to open a clinic no longer need approval from the CFDA. They need only register with the authority.

The government's ultimate goal is to have all Chinese health-care institutions provide a basic level of TCMs by 2020. A roadmap released in February 2016 by the State Council, China's highest administrative body, plans to increase the number of TCM-licensed doctors to 4 per 10,000 people, an increase from less than 3 practitioners per 10,000 people. The government also wants to push TCMs' share of pharmaceutical sales from 26% to 30% by the end of the decade.

Nature 551, 552–553 (30 November 2017)
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What We Can Do to Save Humanity in the Coming Era of Global Eavesdroppers

(or The social innovation way to solve collective action problem)

Victor Christianto
Malang Institute of Agriculture (IPM)
Malang, Indonesia
victorchristianto@gmail.com

Florentin Smarandache
Dept. Math. And Sciences, University of New Mexico
Gallup, USA
smarand@unm.edu

Abstract

In this paper, we tried to draw a fair assessment on things which will take place soon with the coming era of IoT, 5G technology, global eavesdropping and all that. Nonetheless, we are aware that this article sounds quite gloomy. We are not techno-utopians (read Evvgeny Morozov's WSJ article on digital dictatorship[51]), but we are not techno-pessimists either. Perhaps you can consider us as: *"techno-realists"*.[52] This paper was written in the same spirit of Jonathan L. Zittrain's book The Future of Internet and how to stop it.

Keywords — wireless technology, network security, mobile internet security, global eavesdropping, digital dictatorship.

51 https://www.wsj.com/articles/SB10001424052748703983004575073911147404540

52 http://www.technorealism.org/

I. Introduction

One of the great economists of 20th century, John Maynard Keynes, once remarked: *"Everybody wants to go to heaven, but not too soon."* Surely, it depends much on how you define heaven. If you define heaven as fast internet access anywhere, possibility of tracking everything, and plenty choices of movie channels, then you can expect your dream will be fulfilled soon. Especially considering recent news of 5G technology already in place for several cities in China, and *Digit Act Bill* passed by US Senate since 2016, and smartphones getting cheaper and cheaper each month.(1) So you can get access on everything faster than ever. Some futurists even declare the coming of "abundance" era, accelerated by rapid advancement of technology. But now the hard questions: is that really a heaven for the entire global population? Or, are we running faster to nowhere? Let us consider some real examples on how bad things can happen along the way.

II. A Few Examples

1. The leak report by Edward Snowden revealed ongoing advanced eavesdropping by NSA on the entire population of US citizens. Although the details are rather complicated, including perhaps a very peculiar software called PRISM, soon it became clear that such a report is not just fake. Another report reveals argument by intelligence community that such an eavesdropping is necessary in order to anticipate terrorism attack. But Snowden criticized effectiveness of massive surveillance on US ordinary people for tracking potential threat; instead he argued that such a massive surveillance only distracts intelligence community from doing real work on tracking potential harmful terrorists. His prediction became confirmed at the time of attack in Boston, and also in other areas – when no surveillance method could anticipate.

2. After Snowden story was forgotten, there is a recent report on the stolen passwords of all Yahoo email users, during 2013-2014. The number is quite staggering, not just 100 million, not 200 million, but the whole 3 billion users. Of course, nobody from Yahoo officers would admit whether they were just sloppy with their system, or they allowed a sort of backdoor access on PRISM eavesdropping. Other email service providers remain muted on this topic too.(2)
3. There is also a growing number of research papers discussing potential global eavesdropping on various wireless communication systems, including each and every piece of handheld devices.(3)
4. And with *Digit Act Bill*, we can expect there will be plethora of new kind of surveillance cameras with built-in RF technology.
5. On top of that, Internet of Things will enable remote controlling of devices, such as wireless sensors etc. Of course, official ads that you watch on television and newspapers only tell you the best out of these things, such as monitoring your kids at home while you are working and so on. But as the Murphy Law tells us, *"all things which can possibly go wrong, will go wrong."*(5) A number of dystopian movies like "Eagle Eye" depicts how bad things can go when you are being monitored 24 hours a day, and there is no such thing as privacy anymore. And sort of those things are already put in place or underway.

III. What is Global Eavesdropper

According to Alejandro Proano et al.: (6)

> *Wireless sensor networks (WSNs) have shown great potential in revolutionizing many applications including military surveillance, patient monitoring, agriculture and industrial monitoring, smart buildings, cities, and smart infrastructures. Several of these applications involve*

the communication of sensitive information that must be protected from unauthorized parties. As an example, consider a military surveillance WSN, deployed to detect physical intrusions in a restricted area. Such a WSN operates as an event-driven network, whereby detection of a physical event (e.g., enemy intrusion) triggers the transmission of a report to a sink.

Although the WSN communications could be secured via standard cryptographic methods, the communication patterns alone leak contextual information, which refers to event-related parameters that are inferred without accessing the report contents. Event parameters of interest include: (a) the event location, (b) the occurrence time of the event, (c) the sink location, and (d) the path from the source to the sink. Leakage of contextual information poses a serious threat to the WSN mission and operation. In the military surveillance scenario, the adversary can link the events detected by the WSN to compromised assets. Moreover, he could correlate the sink location with the location of a command center, a team leader, or the gateway. Destroying the area around the sink could have far more detrimental impact than targeting any other area. Similar operational concerns arise in personal applications such as smart homes and body area networks. The WSN communication patterns could be linked to one's activities, whereabouts, medical conditions, and other private information.

In the above contexts, contextual information can be exposed by *eavesdropping* on over-the-air transmissions and obtaining transmission attributes, such as inter-packet times, packet source and destination IDs, and number and sizes of transmitted packets. (6)

IV. The Big Picture

In other words, with the coming of IoT, it would mean that we are in the dawn of global eavesdropping. So, what can we do to save our daily life as human being in this planet?

This situation looks really gloomy from each angle, but that will surely happen if we allow corporate-giants take control over each minute of our life – just like in Aldous Huxley's *The brave new world*.[53]

It reminds us to an old story:

> *"There was a guy who one night got into a nightmare, where he live in a country controlled by a terrible dictatorial governor in a province. Many people suffer under that governor. So, he asked himself: "What should I do now? Should I become a rebel, fighting for freedom? Or should I become a liberator, to avoid suffering of those people? Or should I work out my own way up to become a new governor, to replace that cruel bastard? Finally, he came up with a simpler solution: he woke up from his dream. That way he became conscious."*

Perhaps the lesson of the above story is quite similar with a wonderful Italian movie: *Life is beautiful*.[54]

The movie tells a story of an Italian Jewish bookseller called Guido, who just married with Dora. And they got a boy (Giosue). Their happiness was abruptly halted, however, when Guido and Giosue were separated from Dora and taken to a concentration camp. Determined to shelter his son from the horrors of his surroundings, Guido convinced Giosue that their time in the camp is merely a game. He told that in the end his boy will get a prize: a tank. At the end of

53 http://www.idph.com.br/conteudos/ebooks/BraveNewWorld.pdf

54 4 https://en.wikipedia.org/wiki/Life_Is_Beautiful

the movie, Guido did not survive, but his wife and Giosue did. Then a US soldier put him up to a tank, just like what his father promised.

The lesson is that no matter how hard the situation will be, actually we determine our own state of mind. We can choose to be happy, or to be defeated in spirit. We can choose to be human or to be absorbed in the entire system of global eavesdropping. Therefore, let us now consider what our options are.

Here are a few options which you can consider:

1. There are extreme ways of living advocated by technophobia people (Luddism), like cutting off your internet wires, throwing your laptop out of the window, and go to a remote mountain or find the end of the rainbow. We certainly do not advocate that.
2. Going to an exoplanet, a few million light years away from here, is not an option either. Perhaps we should give a decade or more to visionary people like Elon Musk or Jeff Bezos to figure out how we can go there, if it is possible at all.
3. So, for the rest of us, what we can do is to use internet technologies wisely. Update regularly your antivirus software, and change your passwords each 2 months or sooner. And don't use too much free wi-fi in public places, because many people can track you. But if it is okay for you to be monitored by someone else. It is up to you.
4. If you belong to millennial generation, chance is you have become more adept with all these tips. But perhaps you want to do more for society. Our advice is, quoting a word of wisdom for environment activists in 90s: "*Think globally, act locally*." That would mean you should better find a number of friends near you who think likewise, and try to do something good for your community, be it helping orphanage or something like that. We have heard that a number of CEOs only work 3-4 days a week,

and they spend the rest of the week to do what they can do for their community.

5. If your small group gets larger and becomes a national movement, then things get interesting. Do not do lobbying to Senate like those big oil companies in order to advance their interests. Instead, you can try to solve Mancur Olson's problem: *"how your group can do collective action at large scale, while the benefits are not so tangible for everyone"* (4). Our hypothesis is: Olson's collective action problem only applies to unconnected society. In a heavily connected society like ours now, we can figure out how to solve this Olson's dilemma, and doing some meaningful collective actions in the internet.[55] For example: there are some initiatives of online crowdfunding, crowdsourcing, and online cooperatives.[56] So, actually you can start to do something good to your community even with a small amount of fund, provided you plan properly and do it collectively.
6. A few hints for IT folks

   If you are IT folks, perhaps you can try to do some advanced tips as follows:

   To mitigate global eavesdropping, Proano et al. proposed traffic normalization methods that regulate the sensor traffic patterns of a subset of sensors that form MCDSs. They developed two algorithms for partitioning the WSN to MCDSs and SS-MCDSs and evaluated their performance via simulations. Compared to prior methods capable of protecting against a global eavesdropper, they showed that limiting the dummy traffic transmissions to MCDS

55 An outline of reasoning to support this hypothesis can be found in Appendix, albeit it is not so sophisticated.

56 For example: www.startsomegood.com

nodes, reduces the communication overhead due to traffic normalization.(6)

V. The Utilitarian Question: Psychopathic Traits Inside Our Minds

By suggesting an option to do collective action, it does not mean we are not aware that each of us has selfish motive. In fact, some of us on top of the ladder of society have inclination to be a psychopath. Let us quote an interesting article by Lindsay Dodgson: (9)

> In the Diagnostic and Statistical Manual of Mental Disorders, or DSM-5, antisocial or psychopathic personality types are defined as having an inflated, grandiose sense of themselves, and a habit of taking advantage of other people. However, it's still a hard disorder to define, as most of us have some psychopathic traits. In fact, some psychologists believe everyone falls on the psychopathy spectrum somewhere.

On their own, some traits are beneficial to us, such as keeping a cool head, and having charisma. This is why many psychopaths become CEOs, because they can look at the cold, hard facts and make decisions without becoming emotionally involved.

Still, a number of researchers have attempted to find a way of diagnosing psychopathic behavior. One well-known test for psychopaths is the *"The Hare Psychopathy Checklist,"* which analyses how you see yourself and other people.

The team from Columbia Business School and Cornell Universities gave participants a set of moral dilemmas, and also asked them to complete three personality tests: one for assessing psychopathic traits, one assessing Machiavellian traits, and one assessing whether they believed life was meaningful.

This was one of the questions they were asked:

"A runaway trolley is about to run over and kill five people and you are standing on a footbridge next to a large stranger; your body is too light to stop the train, but if you push the stranger onto the tracks, killing him, you will save the five people. Would you push the man?"

The team found that those who answered the dilemmas with an "ethic of utilitarianism" — the view which says the morally right action is whichever one produces the best consequence overall — possessed more psychopathic and Machiavellian personality traits. In the above question, if you'd choose to push the man, you have more in common with the people who had psychopathic or Machiavellian traits.

This makes sense when you think about how Machiavelli generally believed *"the ends justifies the means"*, and that killing innocent people could be normal and effective in politics, as long as the outcome was for the greater good.(9)

This article seems convince us that we need to become aware on our own tendency of being a psychopath. Moreover, it takes honesty to admit that we are prone to be selfish person…then we can work out to be a better person. But there is a deeper question: if controlling our own motive can be very difficult, then where is our society heading? What are our choices?

VI. Where We are Heading From Here

Now, some of you may ask: by suggesting solution to Olson's collective action problem to save our humanity, where is the article heading? Are we advocating collective society as in old day Marxism

hammer? Or are we advocating how to escape from the curse of capitalism's social darwinism?[57]

Yes, normally you read numerous political-economics jargons, e.g. leftist, right wing, centrist left or centrist right and so on.

But it is not our intention to submit another ideological parlance. In fact, these authors are scientist and mathematician, so we are not so inclined to any parlance.

In our opinion, our tendency to cooperate or compete is partly influenced by the culture that we inherit from our ancestors. One of us (VC) once lived for a while in Russia, and he found that many people there are rather cold and distant (of course not all of them, some are friendly). He learned that such a trait is quite common in many countries in Europe. They tend to be individual and keep a distant to each other. In physics term, they are like *fermions*.[58]

There is a developmental psychology hypothesis that suggests that perhaps such a trait correlates to the fact that many children in

57 See for example Richard Hofstadter: Social Darwinism in American thought. url: http://culturism.us/booksummaries/SocialDarwinismHofst.pdf

58 While our proposed simplifying analogy of human behaviour, i.e. individualism and collectivism sound not so common. Indeed such cultural psychology research has been reported since Harry C. Triandis et al. See for example: (a) The Self and Social Behavior in Differing Cultural Contexts, Psychological Review, vol. 96 no. 3; (b) Harry C. Triandis and Eunkook M. Suh, CULTURAL INFLUENCES ON PERSONALITY, Annu. Rev. Psychol. 2002. 53:133–60; (c) J. Allik & A. Realo, Individualism-collectivism and social capital, JOURNAL OF CROSS-CULTURAL PSYCHOLOGY, Vol. 35 No. 1, January 2004, 29-49. This last mentioned paper includes a quote from Emile Durkheim: "The question that has been the starting point for our study has been that of the connection between the individual personality and social solidarity. How does it come about that the individual, whilst becoming more autonomous, depends ever more closely upon society? How can he become at the same time more of an individual and yet more linked to society?"

Europe lack nurtures and human touch from their parents, which make them rather cold and individual. Of course, whether this is true correlation, it should be verified.

On the contrary, most people in Asia are gregariously groupie (except perhaps in some big metropolitans). They tend to spend much time with family and friends, just like many Italians. They attend religious rituals regularly, and so on. In physics term, they are *bosons*. Of course, this sweeping generalization may be oversimplifying.[59]

Therefore, it seems quite natural to us, why Adam Smith wrote a philosophy book suggesting that individual achievement is a key to national welfare (because he was a British which emphasized individualism).[60] It took more than hundred years until mathematicians like John F. Nash, Jr. figured it out that individual pursuit towards their own goals will not lead them to achieve a common goal as society.[61]

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59 After writing up this article, we found that Sergey Rashkovskiy also wrote a quite similar theme, albeit with a statistical mechanics in mind. The title of his recent paper is: "'Bosons' and 'fermions' in social and economic systems." Here is abstract from his paper: "We analyze social and economic systems with a hierarchical structure and show that for such systems, it is possible to construct thermostatistics, based on the intermediate Gentile statistics. We show that in social and economic hierarchical systems there are elements that obey the Fermi-Dirac statistics and can be called fermions, as well as elements that are approximately subject to Bose-Einstein statistics and can be called bosons. We derive the first and second laws of thermodynamics for the considered economic system and show that such concepts as temperature, pressure and financial potential (which is an analogue of the chemical potential in thermodynamics) that characterize the state of the economic system as a whole, can be introduced for economic systems." Url: https://arxiv.org/ftp/arxiv/papers/1805/1805.05327.pdf

60 If only Adam Smith was born in Bangkok or Manila, probably he wrote his book in a different way.

61 Imagine 10 players of a football team go simultaneously to make a goal to their opposite team, will they succeed? Of course no, they should

That is why, we choose to work out Mancur Olson's theorem, because he is able to condense the complicated game theoretical reasoning (whether one should cooperate or not) into a matter of collective actions.

So, which is better: *to be like fermions or bosons*? Our opinion is: just like in particle physics, both fermions and bosons are required. In the same way, fermion behavior and boson behavior are both needed to advance the quality of life. Fermion people tend to strive toward human progress, while boson people are those who make us alive. Just like an old song: Ebony and Ivory….they make harmony in society.

We hope this paper help us to see that collective actions are what made us a human society.[62] And it seems related to *social innovations* and also *social capital* too, in other words a society with social capital and collective actions will ensure its sustainable future.[63] But this is beyond the scope of this article, let us leave such a discussion to economists.

But this article surely does not offer a bold answer to where we are heading as global community. Do we arrive at the end of history or this is just a beginning to a new era? Let time will tell.

VII. Concluding Remarks

In this paper, we tried to draw a fair assessment on things which will take place soon with IoT, 5G and all that. Nonetheless, we are

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arrange according to their coach's instruction: 1-4-4-2, or other type of arrangement.

62 In our country, there is a specific word for some people who work together to achieve a common goal: "gotong royong."

63 Emily Ouma & Awudu Abdulai. Contributions of Social Capital Theory in Predicting Collective Action Behavior among Livestock Keeping Communities in Kenya. url: https://ageconsearch.umn.edu/bitstream/49994/2/Manuscript%20No.%20423_Social%20capital%20theory%20and%20collective%20action.pdf

aware that this article sounds quite gloomy. We are not techno-utopians (read Evgeny Morozov's

WSJ article on digital dictatorship[64]), but we are not techno-pessimists either. Perhaps you can consider us as: *"techno-realists"*.[65] This paper was written in the same spirit of Jonathan L. Zittrain book's *The Future of Internet and how to stop it*.

Allow us to conclude this message with a short message: *"With the coming era of global eavesdroppers, it is not the end of history (Fukuyama). But it will be the end of humanity as we know it, unless we do something collectively to prevent it to happen."* Thank you.

Acknowledgment

These authors would like to express their sincere gratitude to editors of RIEECE 2018. This paper was inspired partly by a recent book by Prof. Adam Grant from Wharton, Give and Take.

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Appendix: Superconductive Olson theorem

Mancur Olson's problem: "how a large group can do collective action, while the benefits are not so tangible for everyone." How to solve it...

Superconductive Olson theorem:

> *"Olson's collective action problem only applies to unconnected society, but not in a digitally connected society."*

Outline of reasoning:

Olson's problem in principle states that in a large group, it becomes difficult to do a meaningful collective action, especially if the benefits for participants are small. That is because individuals mostly seek only their own self-interests.

Let us analyze what actually happens when a group of people is trying to do a collective action. Let us say a group of 10 volunteers want to build mini waste treatment plant for their town. Then they need to gather to discuss the design, the required cost, operational

cost etc. It becomes easier to accomplish the plan provided they live in the same city, so their transportation costs are minimal. In that case, the voluntary group members do not expect much in return, except to do something good for the town.

But let us consider a larger group of volunteers in a national scale, this time they want to gather twice a month in a capital city. So, each member of the group needs to spend cost to go to the capital city. Of course they would expect certain benefits in return in order to pay off the costs they have to spend, otherwise the voluntary plan will not become realized. In both above cases, Olson's analysis is correct. But Olson wrote his Princeton dissertation around 60s. At the time there was no internet connection except perhaps for military purposes.

In our opinion, his theory of collective action is mostly correct, except that he neglects the role of pervasive digital network (internet).

Nowadays, a large group of people can work collectively for a cause with almost zero cost. Therefore, actually there is no barrier anymore to gather a large group to do certain collective actions for the community. For example, gathering polls or doing a petition, e.g, www.petition.com.

Concluding remarks

Our own experience over the past few years also convince us that Olson's collective action problem does not apply in the internet era. It is more like superconductivity phase of material, where electrons can move without resistance. We tend to name our extension of Olson's theorem as *"Superconductive Olson theorem."* Only time will tell what is its role in the future of Internet.

A few remarks on how collective emotion and unyielding determination may contribute to a football outcome:

What we can learn from SpongeBob mentality

Victor Christianto
email: victorchristianto@gmail.com
Founder of The Second Coming Institute, www.sci4God.com

Introduction

Today there will be a match between France and Belgium in World Cup. As we eagerly wait for their performance, allow me to drop a few remarks on how we can enjoy a football game like today.

What makes football so interesting? Not only because of its unpredictability. It is more perhaps because the players show sportive, although occasionally some players choose to play dirty, tackling hard and so on. From such a game, we can sublimate our emotions toward the entire life. Even for those who live in miserable situation, watching football can release a bit their stress.

Over the last few days, while watching some earlier matches in this World Cup 2018 in Russia, I asked: given almost equal skills between two teams, what can affect the outcome of the game?

Yes, flair and skill and speed are all very important. But that's not all that matters. If two teams have more or less equal skills and speed, there should be more factors to consider. I try to condense this problem into: collective emotion and determination.

Collective emotion

A number of recent research suggests that positive collective emotion of a sport team can affect greatly the outcome of the game.[2] According to Meneghen et al.[3]:

> "In the organizational context, the importance of emotions is firmly established, and in recent times researchers have begun to turn their attention toward understanding the processes and outcomes of collective emotion (Rhee 2007). Three main mechanisms have been proposed to explain the emergence of (positive) collective emotion development, namely emotional contagion (Hatfield et al. 1992), emotional comparison (Schachter 1959), and empathy (Hoffman 1985). Whereas emotional contagion denotes a subconscious process of aligning each other's affective reactions, emotional comparison is a more conscious mechanism to compare one's own feelings with those expressed by others, in order to show appropriate and congruent affective reactions (Barsade 2002). In contrast, empathy is based on vicarious affect and team members show similar affectivity by deliberately assuming others' psychological points of view (Nelson et al. 2003). In accordance with these mechanisms, affective responses and emotions within team members can converge and the team can easily achieve a collective mood. Subsequently, in the same way as individuals (Fredrickson and Losada 2005), positive collective emotions are associated with an enhancement in the availability of team resources and resilience to adversity. This theoretical and empirical evidence allows us to go a step further in the B&B theory, in order to verify whether the relationship between positive emotions and resilience is replicated at the collective (team) level in the work context. We therefore expect that:

Hypothesis 1: Collective positive emotions in work teams are positively related to team resilience."

Not only, a good collective emotion will affect resilience, but they also affect the outcome:

"Finally, we postulate that the relationship of positive emotions to team performance is fully mediated by resilience. In fact, in accordance with the B&B theory, positive emotions make it easier to build durable personal resources, and people who are particularly adept at self-generating positive emotions are more likely to be resilient. By contrast, no rationalization was given about the possible relationship between positive emotions and behavioral outcomes, such as work performance. Moreover, previous evidence about the thesis of ''happy-productive workers'' showed that (trait) psychological well-being was related to job performance, whereas (state) positive mood was not (Wright et al. 2004). Consequently, we proposed that team resilience fully mediates the relationship between collective positive emotions and team performance. That is, collective positive emotions help to build team resilience, which in turn increases team performance. Hence, we expect:

Hypothesis 3: Team resilience will mediate the relationship between collective positive emotions and team performance. Specifically, we expect collective positive emotions to be positively related to team resilience, which in turn is positively related with team performance."[3]

In other words, a team must have a positive feeling about themselves. That is way, it is important for a coach to keep a high positive attitude to the team.

More than that, during the game, a team with positive collective emotion will experience "flow."

After all, the entire effect of a game is "flow."

> "Games engage us with challenges. They are designed to create what researcher Mihály Csikszentmihályi calls "flow," which is when we're immersed in something enough to forget the passage of time. We're never bored or overwhelmed because good games keep a perfect balance of hard but not too hard, easy but never too easy. And as we improve, games up the difficulty. We're always stretching our abilities just enough to keep us hooked. McGonigal explains:
>
> Csikszentmihályi's research showed that flow was most reliably and most efficiently produced by the specific combination of self-chosen goals, personally optimized obstacles, and continuous feedback that make up the essential structure of gameplay. "Games are an obvious source of flow," he wrote, "and play is the flow experience par excellence."[1]

Unyielding determination

From the above sources, we can expect that team resilience and collective emotion will affect the outcome. But are they enough? I think there is one more is necessary: unyielding determination.

After skills, speed, flair etc…you need to have unyielding and unbroken mentality…which is also called: endurance, persistence, perseverance etc.

And this trait will influence on your persistence and may be stubbornness when you fall. As Angela Duckworth, the author of Grit, wrote:

> "One of my favorite quotes is from the playwright Samuel Beckett: "Ever tried. Ever failed. No matter. Try Again. Fail

again. Fail better." Like so many things in life, learning from failure is easier said than done. It takes courage to fall on your face and get up again, knowing you'll probably fall again at some point. One thing you can do is model a resilient, optimistic, unashamed reaction to failure."[4]

To illustrate this point of unyielding determination or perseverance, let us quote a story of Jure Robic, from the introduction of Eric Barker's book: [1]

"In a piece for the New York Times, Dan Coyle revealed the edge Robič had over his competition that rendered him the greatest rider ever in the Race Across America: His insanity. That's not an exaggerated way of saying he was extreme. It's a literal way of saying when Robič rode, he utterly lost his mind. He became paranoid; had tearful, emotional breakdowns; and saw cryptic meaning in the cracks on the street beneath him. Robič would throw down his bike and walk toward the follow car of his team members, fists clenched and eyes ablaze. (Wisely, they locked the doors.) He leapt off his bike mid-race to engage in fistfights with mailboxes…."

And what about SpongeBob?

At this point, perhaps we can learn from Spongebob mentality. He always try to do his best to help friends, even at times it turned into a mess.

Let us quote from Yalda T. Uhls (see appendix):

"He seems to me to represent a child, someone who lives for the moment, has no idea about the value of money or power and could care less about social status or physical pursuits. He enjoys hanging out with his friends, blowing bubbles and working hard at his job because he is excellent at grilling patties,..."

I think a key phrase here is "lives for the moment." Enjoying the "now" is very special trait commonly observed in children. Look while they are playing…they play seriously, immersed in the game, yes sometimes they have dispute, but they get back to that game, just to enjoy the moment.

In the words of Huizinga, who coined term **homo-ludens**, play as deep meaning in culture, as follows:

> "Play is older than culture, for culture, however inadequately always presupposes human and animals have not waited for man to teach them their playing. We can safely assert, even, that human civilization has added no essential feature to the general idea of play. Animals play just like men. We have only to watch young to see that all the essentials of human play are present in their merry gambols. They invite one another to play by a certain ceremoniousness of attitude and gesture. Keep to the rule that you shall not bite, or not bite hard, your brother's ear. They pretend to terribly angry. And-what is most important-in all these doings they plainly experience tremendous fun and enjoyment. Such rompings of young dogs are only one of the simpler forms of animal play. There are other, much more highly developed forms: regular contests and beautiful performances before an admiring public.
>
> …In play there is something" at play" which transcends the immediate needs of life and imparts meaning to the action. All play means something. If we call the active principle that makes up the essence of "instinct," we explain nothing; if we call it "mind" or "will" we say too much. However we may regard it, the very fact that play has a meaning a non-materialistic quality in the nature of the thing itself."[5]

And for the rest us: enjoy the show….

Allow me to end this rambling remark with a popular song "Under the sea," to capture the fun on living at the bottom of the sea...and begin to live each moment of your life. Just as Ecclesiastes advised:

"And also that every man should eat and drink, and enjoy the good of all his labour, it is the gift of God." (Eccl. 3:13)

Under the Sea

Samuel E. Wright

The seaweed is always greener
In somebody else's lake
You dream about going up there
But that is a big mistake
Just look at the world around you
Right here on the ocean floor
Such wonderful things surround you
What more is you lookin' for?

Under the sea
Under the sea
Darling it's better
Down where it's wetter
Take it from me
Up on the shore they work all day
Out in the sun they slave away
While we devotin'
Full time to floatin'
Under the sea

Down here all the fish is happy
As off through the waves they roll
The fish on the land ain't happy
They sad 'cause they in their bowl
But fish in the bowl is lucky
They in for a worser fate
One day when the boss get hungry
Guess who's gon' be on the plate?

Under the sea
Under the sea
Nobody beat us
Fry us and eat us
In fricassee
We what the land folks loves to cook
Under the sea we off the hook
We got no troubles
Life is the bubbles
Under the sea (Under the sea)
Under the sea (Under the sea)

Since life is sweet here
We got the beat here
Naturally (Naturally)
Even the sturgeon an' the ray
They get the urge 'n' start to play
We got the spirit
You got to hear it
Under the sea

The newt play the flute
The carp play the harp
The plaice play the bass
And they soundin' sharp
The bass play the brass
The chub play the tub

The fluke is the duke of soul (Yeah)
The ray he can play
The lings on the strings The trout rockin' out
The blackfish she sings
The smelt and the sprat
They know where it's at An' oh that blowfish blow

Yeah, under the sea (Under the sea)
Under the sea (Under the sea)
When the sardine
Begin the beguine
It's music to me (It's music to me)
What do they got?
A lot of sand

We got a hot crustacean band
Each little clam here
Know how to jam here
Under the sea
Each little slug here
Cuttin' a rug here
Under the sea
Each little snail here
Know how to wail here
That's why it's hotter
Under the water
Ya we in luck here
Down in the muck here Under the sea

Songwriters: Howard Elliott Ashman / Alan Menken
Under the Sea lyrics © Walt Disney Music Company,
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Version 1.0: 11 july 2018, pk. 1:31
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on Homo sapiens meaning "Man, the player." A wide ranging work that touches on numerous aspects of the influence of play on culture, it was first published in 1938.)

Appendix:

My Psychological Theory about SpongeBob SquarePants

By Yalda T. Uhls

"Who lives in a pineapple under the sea?"

Most people easily pick up on the importance of television programming like *Sesame Street* and other educational shows for young children. Shows like these embed lessons about letters, manners, multiculturalism and more into their content. For adults, the lessons seem obvious, so we feel good about allowing our children to watch and learn from this kind of television show.

But other shows seem to hold zero promise of learning. One example might be *SpongeBob SquarePants*, an extremely popular cartoon on the Nickelodeon cable channel. Children, including my 4-year old son, were enthralled with this bizarre show about a sponge and his life under the sea. SpongeBob lives in a pineapple next door to a squid that plays the clarinet. He works for a crab that runs the Crabby Patty Diner and his best friend is a starfish. Besides perhaps fostering an interest in marine biology, it's hard to understand the show's ability to fascinate, let alone teach.

Yet after many years of watching this show with my son, I have come to believe that *SpongeBob SquarePants* teaches children fundamental lessons about basic human values in a non-preachy manner through the authentic actions of its characters. First, a two-second primer on values...

Some psychologists believe that human values are a dominating force in life, as values are thought to motivate human behavior and attitudes. The construct was defined and redefined by many famous psychological scientists from Lewin to Rokeach to Schwartz and Kasser. As the study of values advance, the values construct becomes more precise, and a basic list of values with a set of corresponding attitudes and behavior are generally agreed upon. Each theorist may define the overarching categories differently (i.e. intrinsic versus extrinsic, individualistic versus collectivistic, etc), but the specific value types, and their corresponding behaviors, by and large correspond across the theories. Some examples of a value and its corresponding behavior include the value of power — people who value power seek to command others or to lead. Others may value tradition and work towards honoring customs that their parents and grandparents taught them. The list of universal value types tested by the theorist Schwartz includes power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity and security. Kasser, drawing from Schwartz's work, developed and tested a list of goals and values including self-acceptance, affiliation, community feeling, physical fitness, financial success, attractive appearance and social recognition.

It is these kinds of value types that are enthusiastically embraced by the characters in *SpongeBob Square Pants*, and this simple typology may be one of the reasons the show is still popular after ten years. My theory is that each character symbolizes one value type and behaves according to that value in the extreme.

Thus, Mr. Crabs, the owner of the Crabby Patty, cares only about money; his every act in the show is motivated by his pursuit of his financial interests. Meanwhile, Squidward, SpongeBob's neighbor, loves social status and prestige; he wants to be famous and could care less about anything in the small hick town of Bikini Bottom.

Patrick Star, SpongeBob's lovable best friend, exemplifies hedonism. He loves to eat, sleep and in general satisfy the most basic bodily desires.

Sandy Cheeks, a squirrel who lives in an upside down glass bowl under the ocean, pursues intellectual achievement. She is the smartest character in the town and she also enjoys excelling at karate.

Finally, Plankton, the tiny creature that owns a diner next door to the Crabby Patty, values power; he craves the satisfaction of control or dominance.

Each of these characters wrestle with the conflicts that naturally arise as they act according to their values, and while their basic value system usually wins out, the audience witnesses the choices they make in pursuit of these values and the disappointments that arise.

For example, in one episode, Mr. Crabs sells SpongeBob to an evil, ghostly pirate for forty-nine cents. As he realizes he gave up his best worker and moreover, sacrificed him for a measly bit of cash, Mr. Crabs grudgingly learns that perhaps his choice was short-sighted. In the process of watching this kind of episode, children may actually absorb the intrinsic lessons in the storytelling.

***

And what about SpongeBob?

He seems to me to represent a child, someone who lives for the moment, has no idea about the value of money or power and could care less about social status or physical pursuits. He enjoys hanging out with his friends, blowing bubbles and working hard at his job because he is excellent at grilling patties, not because he wants to earn a salary. His attitude is infectious, and his wonderful enthusiastic qualities usually trump those of the other characters.

So in our household, we wholeheartedly embraced this television show and its wacky characters and story lines. When watching with my

son, I celebrated the mini lessons about values (whether intended or not by the show's creator), and underscored the values that resonated with mine as the characters lived, learned and modeled behavior that illustrate through simple storytelling how humans behave.

Follow Yalda T. Uhls on Twitter: www.twitter.com/DrYaldaUhls
Source: https://www.huffingtonpost.com/yalda-t-uhls/spongebob-squarepants_b_1500534.html

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To cite this article: V Christianto *et al* 2018 *J. Phys.: Conf. Ser.* **988** 012005

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An outline of cellular automaton universevia cosmological KdV equation

V Christianto[1], FSmarandache[2], and Y Umniyati[3]
[1]Malang InstituteofAgriculture,Malang,Indonesia.
[2]Department of Mathematics and Sciences,
University of New Mexico, Gallup, USA
[3]Physics Laboratory, Department of Mechatronics,
Swiss German University,
Jalur Sutera
barat No. 15, Alam Sutera, Tangerang, Indonesia
E-mail: victorchristianto@gmail.com; Founderofhttp://www.ketindo.com

Abstract

It has been known for long time that the cosmic sound wave was there since the early epoch of the Universe. Signatures of its existence are abound. However, such a sound wave model of cosmology is rarely developed fully into a complete framework. This paper can be considered a sour second attempt towards such a complete description of the Universe based on soliton wave solution of cosmological KdV equation. Then we advance further this KdV equation by virtue of Cellular Automaton method to solve the PDEs. We submit whole heartedly Robert Kuruczs hypothesis that Big Bang should be replaced with a finite cellular automaton universe with no expansion [4][5]. None the less, we are fully aware that our model is far from being complete, but it appears the proposed cellular automaton model of the Universe is very

close in spirit to what Konrad Zuse envisaged long time ago. It is our hope that the new proposed method can be verified with observation data. But we admit that our modelis still in its infancy, more researches are needed to fill all the missing details.

1. Introduction

Konrad Zuse is probably the first scholar who imagine a Computing Universe. In recent years, there are a few researchers who suggest similar vision interms of cellular automata, for example Stephen Wolfram, Gerardust Hooft, and Robert Kurucz from Harvard Smithsonian of Astrophysics. Nonetheless, it seems that there is no existing model which can be connected with a nonlinear PDE of the Universe. In this paper, we try too offer some working CA models based on the KdV equation, which can be modelled and solved using computer algebra packages such as Mathematica.

Meanwhile, Korteweg-de Vries (KdV) equationisanon-linear wave equation plays a fundamental role in diverse branches of mathematical and the oretical physics. Its significance to cosmology has been discussed by a number of authors, such as Rosu and recently Lidsey [3][7]. It is suggested that the KdV equation arises in a number of important scenarios, including inflationary cosmology etc. Analogies can be drawn between cosmic dynamics and the propagation of the solitonic wave solution to the equation, where by quantities such as the speed and amplitude profile of the wave can be identified with cosmological parameters such as the spectral index of the density perturbation spectrum and the energy density of the universe.

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2. Cosmological KdV equation

The Korteweg-de Vries (KdV) equation is the completely integrable, third-order, non-linear partial dierential equation (PDE) [3]:

$$\partial_t u + \partial_x^3 u + \frac{3}{u_0} u \partial_x u = 0, \quad (1)$$

where $u = u(x, t)$, $\partial_t = \frac{\partial}{\partial t}, \partial_x^3 = \frac{\partial^3}{\partial x^3}$, etc., u_0 is a constant and (x, t) represent space and time coordinates, respectively. This equation was originally derived within the context of small-amplitude, non-linear water wave theory and it is well known that it admits a solitonic wave solution of the form

$$u = u_0 \lambda^2 \sec h^2 \left[\frac{\lambda(x - \lambda^2 t)}{2} \right], \quad (2)$$

where the constant represents the wave number of the soliton. The KdV soliton is characterized by the property that its speed and amplitude are proportional to the square of the wave number.

Rosu [7] and also Lidsey [3] both have considered some cosmological applications of KdV equation. We will consider here one application in inationary universe model. It can be shown that Friedmann equation after some steps which have been discussed in [3], yields to anequation which takes the form of (2), as follows:

$$H^2(\phi) = H_0^2 \lambda^2 \sec h^2 \left[\frac{\lambda A}{2} \right], \quad (3)$$

where

$$A = \frac{\sqrt{8\pi}}{m_p} \phi. \quad (4)$$

Therefore, it appears quite reasonable to consider this equation as originated from certain cosmological KdV phisics.

3. Cellular automata model of KdV equation: Towards cellular automaton universe

There are several methods to consider discretizationof KdV equationinto cellular automata models. Here we briefly discuss only few methods:

(i) Based on paper by [11], KdV equation can be written as a conservation law:

$$\frac{\partial u}{\partial t} + \frac{\partial}{\partial x}\left(-\frac{u^2}{2} - \frac{\partial^2 u}{\partial x^2}\right) = 0. \quad (5)$$

It follows that, after the simplest discretization, we obtain to cellular automata:

$$u_j(t+1) = u_j(t)[u_{j+1}(t) - u_j(t)] + u_{j+2}(t) - u_{j+1}(t) - u_{j-1}(t). \quad (6)$$

Thus $\Sigma_{j=0}^{N-1} u_j(t)$ is not an invariant.

(ii) The discrete analogue of the KdV equation is known thanks to pioneering work Hirota. It has the form [15]:

$$\frac{1}{u_{l+1}^{t+1}} - \frac{1}{u_l^t} = \delta(u_{l+1}^t - u_l^{t+1}) \quad (7)$$

(iii) Another model was proposed by Tokihiro et al around twenty years ago. They suggested that anintegrable discretization (dierential-dierence equation) of the KdV equationis the Lotka-Volterra equation [14]:

$$\frac{d}{dt} b_j t = b_j(t)[b_{j+t}(t) - b_{j-1}(t)] \quad (8)$$

4. Discussion

We advance further KdV equation by virtue to Cellular Automaton method to solve the PDEs. Here, we consider some mathematical methods to discretize the original KdV equation in order to be transformed into cellular automata cosmology models. As far as our knowledge, this approach is different from existing cellular cosmology, such as by Conrad Ranzan (www.cellularuniverse.com).

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PART III

Previous works in cosmology and early Universe

a. *"How Neutrosophic Logic may Resolve Dispute on the Origin of the Universe through re-reading Gen.* 1:1-2." Jurnal Teologi Amreta, Vol. 1, No. 2, April 2018.

   Remark: in this paper we show how a vortex turbulence model of Universe can lead to resolution of Kant's antinomies of reason.

b. "An Outline of New Cosmology Model Inspired by Cosmic Christology of the Johannine Prologue." *Scientific God Journal.* April 2016

c. "On Hermeneutics & Its Relation to Science." *Scientific God Journal.* June 2016

d. "A Comparative Study of Cosmology Revealed from Christology and Trinitarian Approaches." *Scientific God Journal.* June 2016

e. "A Theo-Cymatic Reading of Prolegomena of St. John's Gospel." Scientific God Journal. April 2017

f. "Thinking Out Loud on Primeval Atom, Big Bang & Biblical Account of Creation." - *Scientific God Journal*. February 2018

How Neutrosophic Logic May Resolve Dispute on the Origin of the Universe Through Re-reading Gen. 1:1-2

[1]Editorial Board, Jurnal Teologi Amreta
[2]Dept. Math. & Sciences, Univ. of New Mexico, Gallup, USA
Email: smarand@unm.edu

Abstract

In recent years, the Big Bang as described by the Lambda CDM-Standard Model Cosmology has become widely accepted by majority of phyisics and cosmology communities. But the philosophical problems remain, as Vaas pointed out: *Did the universe have a beginning or does it exist forever, i.e. is it eternal at least in relation to the past?* This fundamental question was a main topic in ancient philosophy of nature and the Middle Ages, and still has its revival in modern phisical cosmology both in the controversy between the big bang and steady state models some decades ago and in the contemporary attempts to explain the big bang within a quantum cosmological (vacuum fluctuation) framework. In this paper we argue that Neutrosophic Logic offers a

* Correspondence: Victor Christianto. Email: victorchristianto@gmail.com (Formerly studying theology at STT Satyabhakti, now he is an independent researcher and lecturer in Malang Institute of Agriculture (IPM), Malang, Indonesia.)

resolution to the long standing disputes between beginning and eternity of the Universe. In other words, in this respect we agree with Vaas, i.e, it can be shown: "how a conceptual and perhaps physical solution of the temporal aspect of Immanuel Kant's *"first antinomy of pure reason"* ia possible, i.e. how our universe in some respect could have both of beginning and an eternal existance. Therefore, paradoxically, there might have been a time before time or a beginning of time and time." By the help of computational simulation, we also show how a model of early Universe with rotation can fit this new picyure. Further observations are recommended.

Keywords: Big Bang, Steady state, rotating universe, fluid, singularity-free, cosmplogy model early Universe, Spirit in Creation.

1. Subjudul

In recent years, the Big Bang as described by the Lambda CDM-Standard Model Cosmology has become widely accepted by majority of physics and cosmology communities. Bur the philosophical problems remain, as Rudiger Vaas pointed out: *Did the universe have a beginning or does it exist forever, i.e. is it eternal at least in relation to the past?* This fundamental question was a main topic in ancient philosophy of nature and the Middle Ages. Philosophically it was more or less banished then by Immanuel Kant's *Critique of Pure Reason.* But it used to have and still has its revival in modern physical cosmology both in the controversy between the big bang and steady state models some decades ago and in the contemporary attempts to explain the big bang within a quantum cosmological framework.

Interestingly, Vaas also noted that Immanuel Kant, in his *Critique of Pure Reason* (1781/1787), argued that it is possible to prove both that the world has a beginning and that it is eternal (first antinomy

of pure reason, A426t/B454t). As Kant believed he could overcome this, self-contradiction of reason" (*"Widerpruch der Vermunjt mit ihr seibst"*, A740) by what he called *"transcendetal idealism"*, the question whether the cosmos exist forever or not has almost vanished in philosophical discussions. [3]

In this paper we will take a closer look at Genesis 1:2 to see whether the widely-accepted notion of *creation ex-nihilo* is supported by Hebrew Bible or not. It turns out that Neutrosophic Logic is in agreement with Kant and Vaa's position, it offers a resolution to the long standing disputes between beginning and eternity of the Universe. In other words, in this respect we agree with Vaas:

> "how a conceptual perhaps physical solution of the temporal aspect of Immanuel Kant's *"first antimony of oure reason"* is possible, i.e. hoe our universe in some respect could have both a beginning and an eternal existance. Therefore, paradoxically, there might have been a time before time or a beginning of time in time." [3]

In the subsequent chapter we will discuss how to answer this question by the lens of hermeneutics of Sherlock Holmes. This is a tool of mind which we think to be a better way compared to critical hermeneutics.

- What is Hermeneutics of Sherlock Holmes? One article suggests:[66]

  Holmes: *"I have no data yet. It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts."*

  Far too often students of the Bible (and cosmology folks as well) twist verses to suit interpretations instead of formulating interpretations to suit what the verses say.

66 https://www.str.org/blog/learning-hermeneutics-from-holmes

Guide: Don't approach your passage assuming you know what it means. Rather, use the data in the passage – the words that are used and how they fit together – to point you toward the correct interpretation.

2. A closer look at Genesis 1:1-2 & implications

One of the biggest mysteries in cosmogony and cosmology studies is perhaps: *How to interpret properly Genesis chapter 1:2*. Traditionally, philosophers proposed that God created the Universe out of nothingness (from reading "empty and formless" and "bara" words; this contention is called "creatio ex nihilo."). Understandably, such a model can lead to various interpretations, including the notorious "cosmic egg" (primeval atom) model as suggested by Georges Lemaitre, which then led to Big Bang model.[18-20] Subsequently, many cosmologists accept it for granted, that Big Bang stands as the most faithful and near est theory to Biblical account of creation est theory to Biblical account of creation est theory to Biblical account of creation est theory to Biblical account of creation est theory to Biblical account of creation est theory to Biblical account of creation . But we can ask: *Is that primeval atom model the true and faithful reading of Genesis 1:2?*

Let us start our discussion by examining key biblical words of Hebrew Bible, especially Genesis 1:1-2. It can be shown that the widely accepted creatio ex nihilo is *a post-biblical invention*, rather than a faithful reading of the verses. To quote Ian Barbour: *"Creation out of nothing is not a biblical concept."*[4]

Let us consider some biblical passages:

- The literal meaning of Gen. 1:1, *"bareishit bara Elohim."* This very first statement of the book of Genesis literally reads: 'first' and 'beginning' are reasonable alternatives for the Hebrew noun,

reishit. Also note that in Hebrew, subjects and verbs are usually ordered verb-first (unlike English in which the subject is written first). If the verb and subject of this verse are reordered according to natural English grammar we read: [1]

{In, When} {first, beginning} Elohim created…

reishit: The noun, reishit, has as its root the letters, ראש (Resh -Aleph-Shin). Words derived from this root often carry the meaning of 'primary', 'chief', 'begin', 'first' or "first-in-line", "head of", and so forth. Harris's Theological Wordbook of the Old Testament (TWOT) is more specific, namely, reishit means[1]

"…first, beginning, choicest, first or best of a group. [Reishit is] a feminine noun derived from the root [Resh-Aleph-Shin], it appears fifty times in nearly all parts of the [Old Testament]. [Its] primary meaning is "first" or "beginning" of a series."

Accordingly, we can now retranslate *bəreishit* bara Elohim as "When first created Elohim", or as we would render in English,[1]

When Elohim first created…

- Gen. 1:2, "And the earth had been." In English this is easily handled by the past perfect tense (also called the pluperfect or the "flashback" tense). Likewise, if *haytah* in v 1:2 is translated as a past perfect verb, then verses 1:1-2 would read,[1]

  When Elohim first created the heavens and the earth, the earth had been …

  In this translation the Universe, in some form or other, was already in existence when God executed His first creative act, the creation of light.

- A re-reading of Gen. 2:7 with Hermeneutics of Sherlock Holmes[67]

  If we read closely at Gen. 2: 7, we see that man is made up of the dust of the ground (adamah) which is breathed by the breath of life by God (nephesh). Here we can ask, does this text really support the Cartesian dualism view?

  We do not think so, because the Hebrew concept of man and life is integral. The bottom line: it is not the spirit trapped in the body (Platonic), but the body is flowing in the ocean of spirit.

- Let's look at three more texts:

  a. Gen. 1: 2, *"The earth is without form and void, darkness over the deep, and the Spirit of God hovering over the waters."* Patterns such as Adam's creation can also be encountered in the creation story of the universe. Earth and the oceans already exist (similar to *adamah*), but still empty and formless. Then the Spirit of God hovered over it, in the original text "*ruach*" can be interpreted as a strong wind (storm). So we can imagine there is wind/hurricane, then in the storm that God said, and there was the creation of the universe. See also Amos Yong's book Spirit in

  Creation [6], also Hildebrandt [15]. From a scientific point of view, it is well known in aerodynamics that turbulence can cause sound (*turbulence-generated sound*). And primordial sound waves are indeed observed by astronomers.

  b. Ps. 107: 25, *"He said, he raised up a storm that lifted up his waves."* The relation between the word (sound) and the storm (turbulence) is interactive. Which one can cause other.

67 Check Eric McKiddie's article: https://www.thegospelcoalition.org/blogs/trevin-wax/10-tips-on-solving-mysterious-bible-passages-from-sherlock-holmes/

That is, God can speak and then storms, or the Spirit of God causes a storm. Then came the voice.

c. Ezekiel. 37: 7, *"Then I prophesy as I am commanded, and as soon as I prophesy, it sounds, indeed, a crackling sound, and the bones meet with one another."* In Ezekiel it appears that the story of the creation of Adam is repeated, that the Spirit of God is blowing (storm), then the sound of the dead bones arises.

The conclusion of the three verses above seems to be that man is made up of *adamah* which is animated by the breath or Spirit of God. He is not matter, more accurately referred to as spirit in matter.

In other words, a closer reading of Hebrew Bible seems to suggest that *creatio ex-nihilo* is a post-biblical invention. Other scholars have suggested an alternative concept, called creatio *ex-materia*, but many orthodox Christian scholars have raised objection to this term, partly because the term seems to undermine God's ultimate power and control of the Universe. Besides, the notion of creatio *ex-materia* has been advocated by Mormon preachers.

To overcome this problem, and based on what we learned recently, allow us now to come up with a new term: ***creatio ex-rotatione*** (*rotatione* is a Latin word for "rotation)". As we shall see in the next chapter, it is possible to come up with a physical model of early Universe with rotation, where the raw materials have been existed for long period of time, but suddenly it burst out into creation. And it seems to fit with Kant's idea to resolve the dichotomy between finite past or eternal Universe. Furthermore, it can be shown that the model naturally leads to accelerated expansion, without having to invoke ad hoc assumptions like dark energy or cosmological constant.

3. A computational model of rotation in early Universe

Our discussion starts from the fundamental question: how can we include the rotation in early Universe model? After answering that question, we will discuss how *"turbulence-generated sound"* can be put into a mathematical model for the early Universe. We are aware that the notion of turbulence-generated sound is not a new term at all especially in aerodynamics, but the term is rarely used in cosmology until now. We shall show that 3D Navier-Stokes will lead to non-linear acoustics models, which means that a turbulence/storm can generate sound wave.

It has been known for long time that most of the existing cosmology models have singularity problem. Cosmological singularity has been a consequence of excessive symmetry of flow, such as "Hubble's law". More realistic one is suggested, based on Newtonian cosmology model but here we include the vortical-rotational effect of the whole Universe.

In other paper, we obtained an Ermakov-type equation following Nurgaliev [8]. Then we solve it numerically using Mathematica 11. An interesting result from that simple computational simulation is shown in the following diagram:[9]

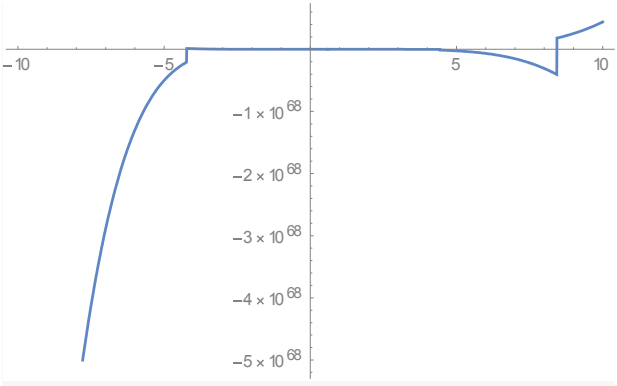

Diagram 1. Plot of Ermakov-type equation for A=1, B=-10 (from [9])

From the above computational experiment, we conclude that the evolution of the Universe depends on the constants involved, especially on the rotational-vortex structure of the Universe. This needs to be investigated in more detailed for sure.

One conclusion that we may derive especially from Diagram 1, is that our computational simulation suggests that it is possible to consider that the Universe has existed for long time in prolonged stagnation period, then suddenly it burst out from *empty and formless* (Gen. 1:2), to take its current shape with observed "late accelerated expansion."

As an implication, we may arrive at a precise model of flattening velocity of galaxies without having to invoke ad-hoc assumptions such as dark matter.

Therefore, it is perhaps noteworthy to discuss briefly a simple model of galaxies based on a postulate of turbulence vortices which govern the galaxy dynamics. The result of Vatistas's model equation can yield prediction which is close to observation, as shown in the following diagram:[14]

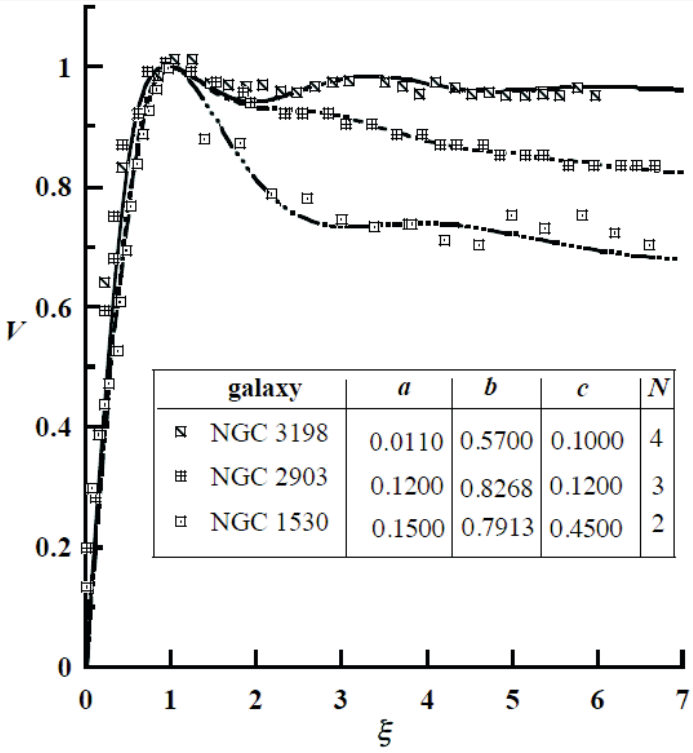

Figure 1. From Vatistas [14]

Therefore, it appears possible to model galaxies without invoking numerous ad hoc assumptions such as *dark matter*, once we accept the existence of turbulent interstellar medium. The Vatistas model is also governed by Navier-Stokes equations, see for instance [14].

5. Neutrosophic Logic perspective and implications

In the previous sections we have discussed how a closer look at Gen. 1:1-2 leads to different scenario than the widely accepted creatio *ex-nihilo*. This new scenario is quite in agreement with Kant's idea that it is possible that the Universe has *both* finite history in

the past and also eternal background. We also discussed how such a mixed view can be modelled by introducing rotation in the early universe.

Now there is an immediate question: Is this new look at the origin of Universe justifiable logically, or is it merely a compromised solution?

So, in this chapter we will review Neutrosophic Logic, a new theory developed in recent decades by one of these authors (FS).

Vern Poythress argues that sometimes we need a modification of basics of philosophy of mathematics, in order to re-define and redeem mathematics; see [21]. In this context, allow us to argue in favor of Neutrosophic logic as one basic postutale, in lieu of the Aristotle logic which creates many problems in real world.

In Neutrosophy, we can connect an idea with its opposite idea and with its neutral idea and get common parts, i.e. <A> /\ <nonA> = nonempty set. The common part of the uncommon things! It is true/real... paradox. From neutrosophy, all started: neutrosophic logic, neutrosophic set, neutrosophic probability, neutrosophic statistics, neutrosophic measure, neutrosophic physics, neutrosophic algebraic structures etc.

It is true in restricted case, i.e. the Hegelian dialectics considers only the dynamics of opposites (<A> and <antiA>), but in our everyday life, not only the opposites interact, but the neutrals <neutA> between them too. For example: you fight with a man (so you both are the opposites). But neutral people around both of you (especially the police) interfere to reconcile both of you. Neutrosophy considers the dynamics of opposites and their neutrals.

So, neutrosophy means that: <A>, <antiA> (the opposite of <A>), and <neutA> (the neutrals between <A> and <antiA>) interact among themselves. A neutrosophic set is characterized by

a truth-membership function (T), an indeterminacy-membership function (I), and a falsity-membership function (F), where T, I, F are subsets of the unit interval [0, 1].

As particular cases we have: single-valued neutrosophic set {when T, I, F are crisp numbers in [0, 1]}, and interval-valued neutrosophic set {when T, I, F are intervals included in [0, 1]}.

Neutrosophic Set is a powerful structure in expressing indeterminate, vague, incomplete *and* inconsistent information. See also [22]-[24].

To summarize, Neutrosophic Logic study the dynamics of neutralities. And from this viewpoint, we can understand that it is indeed a real possibility that the Universe has both initial start (creation) but with eternal background. This is exactly the picture we got after our closer look at Gen. 1:1-2 as discussed in the above section.

In other words, our proposed term of *"creatio ex-rotatione"* has sufficient logical background.

6. Advantages of "creatio ex-rotatione" concept

In the preceding section, we have discussed on how our proposed term of *"creatio ex-rotatione"* has sufficient logical background.

Now, allow us to discuss some advantages of the proposed *"creatio ex-rotatione"* cosmology view over the Lemaitre's primeval atom hypothesis (which is the basis of Standard Model Cosmology).

a. Explain excess of handedness in galaxies

As reported by Longo et al, there is an excess of left-handedness in spiral galaxies. According to Longo, the simplest explanation of such left-handedness is that there is *net angular momentum* of the Universe. This seems to suggest that our hypothesis of

creatio ex-rotatione is closer to the truth with respect to origin of the Universe. [2]

b. Avoid inflationary scheme.

It is known that inflationary models were proposed by Alan Guth et al. (see [25][26]), in order to explain certain difficulties in the Big Bang scenario. But some cosmology experts such as Hollands & Wald have raised some difficulties with inflationary model, as follows:

"We argue that the explanations provided by inflation for the homogeneity, isotropy, and flatness of our universe are not satisfactory, and that a proper explanation of these features will require a much deeper understanding of the initial state of our universe."[27]

In our diagram plot above, it is clear that an early rotation model can explain why the Universe can burst out into creation in a very short period, without invoking *ad hoc* hypothesis such as inflation model.

c. Explain late accelerated expansion.

As far as we know, one of the earliest models which gave prediction of accelerated expanding Universe is Carmeli's Cosmological General Relativity.[29]

But it has been shown by Green & Wald that for the large scale structures of the Universe, Newtonian model can give similar results compared to general relativity picture.[28]

Furthermore, it seems that there is no quite clear argument why we should accept Carmeli's use of 5D metric model (space-time-velocity metric).

In the meantime, in our rotating Universe model, we do not invoke ad hoc dimension into the metric.

d. Explain inhomogeneity, breeding galaxies etc.

Astronomers have known for long time, that the Universe is not homogeneous and isotropic as in the usual model. It contains of inhomogeneity, irregularity, clumpiness, voids, filaments etc, which indicate complex structures. Such inhomogeneous structures may be better modelled in terms of turbulence model such as Navier-Stokes equations, see also our early papers [11] [12].

Furthermore, observations clearly suggest that matter ejected continuously in galaxy centers, which view is difficult to reconcile with Big Bang scenario of galaxy creation.

7. Conclusions

In this paper we argue that Neutrosophic Logic offers a resolution to the long standing disputes between beginning and eternity of the Universe. In other words, in this respect we agree with Vaas, i.e. it can be shown: "how a conceptual and perhaps physical solution of the temporal aspect Immanuel Kant 's *"first antinomy of pure reason"* is possible, i.e. how our universe in some could have both a beginning and an eternal existence. Therefore, paradoxically, there might have been a time before time or a beginning of time in time. "

We argue that a close re-reading of Genesis 1:2 will lead us to another viable story compared from Lemaitre's primeval atom model of early Universe, albeit this alternative has not been developed rigorously as LCDM theories.

By the help of computational simulation, we also show how a model early Universe with rotation can fit this new picture. And one conclusion that we may derive especially from Diagram 1, is that it is possible to consider that the Universe has existed for long time in prolonged stagnation period, then suddenly it burst out from *empty*

and formless (Gen. 1:2), to take its current shape with accelerated expansion. Such a possibility has never been considered before in cosmology literatures.

It is our hope that exploration will lead to more realistic nonlinear cosmology theories which are better in terms of observations, and also more faithful to Biblical account of creation.

Acknowledgment

The first author (VC) would like to express his gratitude to Dr. Joas Adiprasetya, Dr. Yonky Karman, and Dr. Wonsuk Ma for discussions on early creation of the Universe. We also thank to a number of professors in physics, including Prof. Bambang Hidayat, Prof. Liek Wilardjo and Prof. Thee Houw Liong. *May God be with you*.

Document history: version 1.0: 10 March 2018, pk. 20:22

VC & FS

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Editor's note:

In order that the readers can find a more balanced perspective, here we include the comments from reviewer on this paper:

"Artikel ini memandang Kejadian 1:1-2 sebagai sebuah *scientific statements*. Padahal ini tidak dapat dipandang demikian. Jika 1:1-2 dipandang sebagai *scientific statements* maka *the rest of the account should be treated the same*. Jika itu dilakukan maka akan menimbulkan kesulitan, seperti masalah hari misalkan. Apakah hari akan dipandang sebagai 24 jam atau jaman atau apa? Beberapa pandangan yang ada itu juga menonjolkan argumen *scientific* mereka masing-masing. Lebih luas, kejadian 1:1-2 adalah bagian

dari unit yang lebih besar yaitu kejadian 1-11 atau *primeval history*. Maka seharusnya unit yang lebih besar ini pun harus dipandang sebagai *collection of scientific statements*. Jika demikian semakin banyak kesulitan akan muncul, menjelaskan terangkatnya henokh, masalah diterimanya persembahan Habel dan ditolaknya persembahan Kain, bagaimana Kain bisa mengerti jika persembahannya ditolak, dll.

Pemisahan *be* dengan *reshit* dan menerjemahkannya menjadi ketika Allah menciptakan adalah pemisahan yang tidak tepat. *Bereshit* selalu muncul dalam *construct state* yang berarti *in the beginning*.

The fact that *ruach* elohim can refer to great ancient mighty wind observed by astronomer is not a direct prove that creatio ex nihilo is wrong.

Ps. 107: 25, → Psalm is a poem which use hiperbolic expression, thus the structure of the word in this verse can not be used as a refference of how is the order of the event naturally.

Ezekiel. 37: 7 pada hakikatnya adalah bahasa figuratif yang tentunya simbol-simbol di dalamnya tidak dapat digunakan secara sejajar untuk sesuatu yang sifatnya *scientific*.

Bagaimana bisa mengatakan bahwa *creatio ex nihilo* adalah ide post *biblical invention* dan kemudian malah mengusulkan *creatio ex rotatione* yang disebut cocok dengan idenya Kant. Bukankah ini dapat disebut lebih "post biblical" dari yang ditolaknya tadi.

Spirit sebagai material in the spirit sangat tidak tepat dengan pandangan Ibrani tentang spirit. Spirit is seen as perpanjangan tangan dari Allah.

Finally rotational model completelly asing bagi hebrew people, but sovereignity of God is not.

After all, this is a very good effort to explain from the scientific point of view of creation.

Further comments

Karena tulisan ini lebih ke arah science, justru perbedaan yang ada yang saya berikan di atas akan mengajar pembaca untuk melihat pergumulan antara science dan faith. Jadi rekomendasi saya adalah *publish as submitted*.

An Outline of New Cosmology Model Inspired by Cosmic Christology of the Johannine Prolugue

Victor Cristianto*

Abstract

This article discusses an outline a new cosmology model based on my interpretation of the Johannine Prolugue. The objective of this article is to propose a new cosmology model which is biblically sound and scientifically verifiable, inspired by cosmic Christology of the Johannine Prolouge. Because this is only an outline, it should be obvious that this is not a complete and working cosmology model. More research is needed to develop it further and also to test this idea. New experiments may be expected in the future to verivy this proposal.

Key Words:

New cosmology, cosmic Christology, Johannine Prologue.

* Correspondence: Victor Christianto, Independent Researcher. Email: victorchristianto@gmail.com.

Introduction

Despite many efforts in the literature to discuss various cosmology models from biblical perspectives,[68] it is a common view held by many scholars that biblical view (Creation) and the scientific view (Big Bang) cannot be reconciled. Therefore most scholars simply reject biblical teaching as unscientific while most theologians simply ignore the Big Bang theories. Of course, there are also some variations of Creation hypothesis, such as the assertion that the Universe was created by God not in 6x24 hours, but in several thousand years. Another new theory is called as Intelligent Design, saying that the observed complicated structure both in microphysics (DNA, RNA etc) and macrophysics (galaxy, galaxy clusters, planets, stars) seems to point to a Supreme Creator. Therefore we need a new Cosmology model which is able to reconcile both the scientific finding and also the biblical teaching.

Question 1: Can we find a biblically sound model of Cosmology?

Traditionally the battle between theologians in one side and scientific world in another side seems to be almost irreconcilable. Even since the days of Galileo Galilei the dispute was quite harsh, with tendency of denying each other side.[69]

In modern days, the scientific finding of expanding galaxies by Edwin Hubble led to the Expanding Universe theory as suggested A. Friedman and G. Lemaitre. Lemaitre himself was a devoted Catholic priest, but he carefully distinguished between the point of beginning and the point of Creation. However, he seemed to assert that the

68 See for instance: Willem B. Drees. Beyond the Big Bang: Quantum Cosmologies and God. La Salle, Illinois: Open Court Publ. Co., 1990

69 George V. Coyne & Michael Heller. A Comprehensible Universe. New York: Springer-Verlag New York, 2008.

Expanding Universe suggests a point of singularity or the beginning of time, which later it is called as the Big Bang.

In the context of scientific theories, we should admit that initially Big Bang Theory was made as a result of backward extrapolation of the Hubble law. The Hubble law itself only asserts that galaxies move away from each other. And if this law was extrapolated back to the origin of time, then we find that there should be a singularity which then was called as Big Bang.

However, the Big Bang or singularity itself is not free of criticism, both from steady state perspective and also from the rigorous theory of singularity itself. This directs us to a new question which will be discussed subsequently: Can the initial singularity be removed from cosmology models?

Provided the above question concerning initial singularity can be answered, then my answer to the first question is positive: yes, we can propose a new biblically sound Cosmology model with intention to reconcile biblical teaching with scientific findings.

Question 2: Can the initial singularity be removed from cosmology models?

This question has been discussed in a report by Prof. Michael Heller, a cosmologist and theologian from Warsaw, Poland. In a paper for Templeton Prize, he discusses this problem: Cosmological Singularity and the Creation of the Universe.[70] He discusses among other things, how singularity is actually model dependent, and in different cosmology models the initial singularity can be removed. In other words, the notion of Big Bang is just a special case of the chosen space-time metric.

70 Michael Heller. Cosmological Singularity and the Creation of the Universe. http://www.templetonprize.org/pdfs/93-113.pdf

In this regards, I have brought this issue in a question at researchgate.net forum, and there are many comments from other scholars. To summarize their views, it seems that they agree with Prof. Heller that the initial singularity can be removed in different cosmology models. Some references in this context have been cited by contributors to that forum.[71]

A short summary of Dabrowski and Marosek[72] will be made here: Varying physical constant cosmologies were claimed to solve standard cosmological problems such as the horizon, the flatness and the Λ–problem. But one of the most intriguing problems in cosmology is the problem of singularities. In their paper, they suggest yet another possible application of theories suggesting varying physical constants: i.e. to solve singularity problem.[73]

In Belbruno's paper, it is shown that dynamical flow near the big bang singularity can be reduced to a central force field, when modeled by an anisotropic Friedman equation, under a number of assumptions. Then he applies the McGehee transformation to the central force field, yielding unique branch extensions of solutions through $a=0$.[74]

If it is true that the initial singularity is model dependent, then it seems that the Big Bang can be removed too. In other words, there is a hope to describe the Universe as free from initial singularity.

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71 Edward Belbruno. On the regularizability of the Big Bang Singularity (2012). arxiv.org/1205.1474v2.pdf

72 Mariusz P. Dabrowski & Konrad Marosek. Regularizing cosmological singularities by varying physical constants (2012). arxiv.org/1207.4038v4.pdf

73 *Ibid*.

74 Edward Belbruno. On the regularizability of the Big Bang Singularity (2012). arxiv.org/1205.1474v2.pdf

Question 3: Can we model the Universe based on classical wave equation?

First, I shall recall a study conducted by some researchers from Observatoire de Paris – Meudon several years ago which suggests that vibration of early Universe can be used to determine the shape of the Universe. This study is led by Prof. J. Luminet.[75] What is interesting here is that they solved Helmholtz equation in spherical case to find out the vibration of early Universe. And we know that Helmholtz equation implies classical wave equation, therefore by deduction we can infer that it seems also possible to use Helmholtz equation to determine the vibration of early universe, and perhaps it can be related either to CMBR oscillation or Sakharov oscillation.[76] However, we should admit that oscillation of early universe has not received much attention so far, even though Sakharov (acoustic) oscillation is well known among cosmologists. Figure 1 below depicts CMB temperature anisotropies:

75 URL: http://www.obspm.fr

76 L.P. Grishchuk. Cosmological Sakharov oscillations and Quantum Mechanics of the early Universe (2011). arXiv: 1106.5205 [gr-qc]

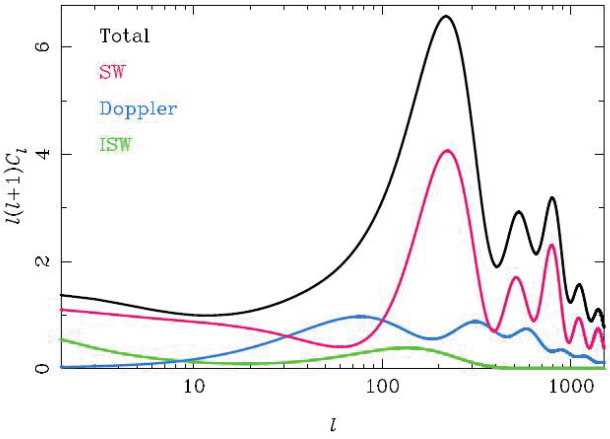

Figure 1. Various contributions to CMB temperature anisotropies [7, p.13].

Second, Hawking-Hartle wavefunction equation and Wheeler-DeWitt equation are two well-known equations for describing quantum scenario for the birth of the Universe (the quantum birth). These two equations are based on extrapolating wave mechanical arguments to the Universe scale, however both of them are lacking observability so far and they cannot explain any observation (data). Therefore it is fair enough to say that both equations are defective and useless equations for describing physical phenomena at large scales. Nonetheless, these equations indicate that it seems worth to study the wave nature of the Universe. Therefore, while we do not advocate the use of H-H or WDW equation, we still can use their approach to model the wave nature of the Universe.

Third, my own personal study since 2002 can be summarized as follows: For once in my life, I believed that Quantum Mechanics (QM) is the sought answer for almost all physics problems, not only for atomic and particle world but also for astrophysics scale. For cosmologists, there is Wheeler-DeWitt equation which is borrowing

quantum mechanical concept to study early period of the Universe. But everybody knows that WDW equation does not predict anything, so I tried to find another way.

Before I continue, firstly allow me to admit something: I should admit that I was very interested in quantum theory especially the wave mechanics since I read a book published by Santa Fe Institute/Addison-Wesley and edited by Wojciech H. Zurek with title: *Complexity, Entropy and the Physics of Information*.[77] I bought that book in 1996, and then studied it in my spare time. After that, I became interested in the wave mechanical model of solar system (planetary orbits) since I found a paper by Laurent Nottale from Paris. But I found that Nottale's Scale Relativity method is quite complicated, therefore I tried to derive his result in a simpler way (based on some quantum mechanics textbooks that I read at the time).

It took some years until I found time and energy to put my ideas in written form and then finally I can publish my first paper in Apeiron, January 2004.[78] In that paper, I discuss quantization of planetary orbits in solar system based on Bohr's quantization of angular momentum. I also predicted three planetoids beyond orbit of Pluto; and later on those 3 planetoids have been discovered subsequently by several astronomers including Dr. Michael Brown from Caltech I (around 2004-2005). After that, I published many more papers discussing various aspects of quantum/wave mechanics, but the basic view remains the same: that I was quite convinced that the quantum mechanics is a wonderful theory (like what many physicists used to think nowadays), although it is perhaps incomplete. In particular I

77 Zurek, Wojciech H. ed. Complexity, Entropy and the Physics of Information. Santa Fe Institute/Addison-Wesley Publ., 1990

78 Christianto, V. A Cantorian Superfluid Vortex and the Quantization of Planetary Motion. Apeiron Vol. 11 No. 1, January 2004, URL: http://redshift.vif.com.

was interested in the quantized vortices model of planetary orbits, because I found that quantized vortices correspond neatly to Bohr's quantization rule. Therefore, it would suggest that we can think that quantization in solar system is a result of quantized helium vortices.

But since 2009, I took a rather different view, which is to find possible connection between quantum mechanics and classical mechanics. That view was expressed in my 2009 paper together with Prof. Florentin Smarandache with title: *A derivation of Maxwell's equations in quaternion space.* In that paper we managed to derive a quaternionic form of Maxwell equations, based on Dirac-Gersten's decomposition method.[79] Since then, I sought further on how to connect classical mechanics and wave mechanics. But still, my basic view is that the wave mechanics eventually supersede classical mechanics. (During the period of 2005 until 2013, I have published no less than 9 books together with Florentin Smarandache and others.) For an introduction to the relationship between classical and quantum theory, see for instance Landsman.[80]

That view I hold until March 2014, when I found some papers written by Dr. George Shpenkov from googling. He explained among other things that there are some weaknesses of wave mechanics especially Schrödinger's equation. I sent him several emails and he emailed me back with some papers and books. After studying his papers and books, I decided that the classical wave equation can complement wave mechanics, and even they are compatible as indicated for instance by the exact correspondence between Poisson bracket and quantum commutator bracket.

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79 Christianto, V., & Smarandache, F. A derivation of Maxwell's equations in quaternion space. Progress in Physics, 2009. URL: http://www.ptep-online.com

80 Landsman, N.P. Between classical and quantum (2005). arXiv:quant-ph/0506082.

In short, I am now convinced that in certain cases like planetary orbits, periodic table of elements, and energy levels of hydrogen, the classical wave equation is proved to be equal or even far better than quantum model.

Now, I think it is the right time to study whether the classical wave equation can also be generalized to describe vibration and other properties of the Universe at large scale. I propose to use a new framework called "*fractal vibrating string*" in order to generalize the classical wave equation. As far as I know, such a fractal vibrating string concept has not been discussed elsewhere before to study astrophysics and cosmology phenomena.

The proposed solution: A Cosmology model inspired by the Johannine Prologue

As we know there are two main paradigms concerning the origin of the Universe: the first is Big-Bang Theory, and the other is Creation paradigm. But those two main paradigms each have their problems, for instance Big Bang Theory assumes that the first explosion was triggered by chance alone, therefore it says that everything emerged out of vacuum fluctuation caused by pure statistical chance. By doing so, its proponents want to avoid the role of the *Prime Cause* (God). Of course there are also other propositions such as the Steady State theory or Cyclical universe, but they do not form opinion of the majority of people in the world.[81]

On the other side, the Creation Theory says that the Universe was created by God in 6x24 hours according to Genesis chapter 1, although a variation of this theory says that it is possible that God created the Universe in longer period of thousands of years or even

81 Andrew Zimmerman Jones & Daniel Robbins. String Theory for Dummies. Indianapolis, Indiana: Wiley Publishing Inc., 2010. P. 169.

billions of years. But such a proposition seems to be not supported by Biblical texts.

To overcome the weaknesses of those main paradigms, I will outline here another choice, namely that the Universe was created by Logos (Christ in His pre-existence). This is in accordance with the Prolegomena of the Gospel of John, which says that the Logos was there in the beginning (John 1:1).[82]

This famous Prolegomena of the Gospel of John may be interpreted that everything comes from the Word of God, and since Word means Voice, and Voice means sound, and sound can be related to wave, vibration and frequency, then it seems quite straightforward to think that everything in this universe consists of vibration and frequency too. While the above analogy with the Gospel of John is suggested by this writer, such a view that everything is related to wave and frequency has been proposed by George Shpenkov.[83] He wrote as follows:

> "A new physics paradigm that we have accepted and follow in all our works is based on: (1) Dialectical philosophy and dialectical logic; (2) The postulate on the wave nature of all phenomena and objects in the Universe."[84]

This writer would like to propose an interpretation i.e. if Genesis 1:1-2 is interpreted according to John 1:1, then it seems we can arrive at a different picture of creation, that is the Universe was created by

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82 Victor Christianto. An Outline of Cosmology based on interpretation of The Johannine Prologue. Bull. Soc. Math. Services and Standards. Vol. 3 No. 3 (2014) URL: www.scipress.com

83 George P. Shpenkov. Dialectical View of the World: The Wave Model (Selected Lectures). Volume I: Philosophical and Mathematical Background (2013). URL: http://shpenkov.janmax.com/Vol.1.Dialectics.pdf

84 *Ibid.*, p.7.

the Word of God (Greek: Logos, Aramaic: Memra) with the power of the Spirit of God.[85] And because the Logos is "word", then it could mean voice or sound, and if sound can be interpreted as wave and frequency, then it seems quite logical to think that everything in the Universe are formed of wave and frequency (vibration). Therefore it is important to work on classical wave equation (vibrating string) instead of Schrödinger equation to model wave nature of atoms and molecules, partly because the wave mechanics is unrealistic model.[86]

A theory which supports this hypothesis is George Shpenkov's interpretation on the classical wave equation, which leads to the following conjectures: a. *shell-nodal* model of atoms and molecules; b. a periodic table of elements which is close to periodic table of Mendeleyev. And this writer proposed a further step, i.e. to extend further the classical wave equation to become *fractal vibrating string*, as mentioned briefly in a recent paper.[87]

Philosophically speaking, the fractal vibrating string has similarities with string theory, because both of them are based on the same hypothesis that particles come out of frequency and vibration, although they also have major difference that is string theorists must work with 26 dimensions: "… the universe has a total of 26 dimensions in string theory, as opposed to the four dimensions it possesses under Einstein's special and general relativity theories".[88]

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85 Christianto, V. An Outline of Cosmology based on interpretation of The Johannine Prologue. Bull. Soc. Math. Services and Standards. Vol. 3 No. 3 (2014) URL: www.scipress.com

86 Christianto, V. A review on Schrödinger equation & classical wave equation. Prespacetime Journal Vol.5 No. 5, May 2014. URL: http://www.prespacetime.com or http://www.vixra.org/author/Victor_Christianto

87 Christianto, V. An Outline of Cosmology based on interpretation of The Johannine Prologue. Bull. Soc. Math. Services and Standards. Vol. 3 No. 3 (2014) URL: www.scipress.com

88 Jones, Andrew Zimmerman & Daniel Robbins. String Theory for Dummies. Indianapolis, Indiana: Wiley Publishing Inc., 2010. P. 169.

Another major difference is that so far string theory has no single prediction which can be compared with observation or experiment, while the proposed *fractal vibrating string* model is closer to our everyday's experience.

Therefore, my vision can be summarized as follows: My vision is to extend Dr. George Shpenkov's method (he uses the classical wave equation) to become fractal vibrating string. I hypothesize that many phenomena from microscale up to macroscale can be described using *fractal vibrating string*. And it should be noted here that the proposed *fractal vibrating string* here is different from fractal string theory of Dr. Michel Lapidus, and it is also different from the "standard" string theory (although philosophically speaking, they may have some similarities). One of the basic differences is that in string theory, one should work with 26 dimensions, which is not necessary for studying fractal vibrating string.

To the best of our knowledge, such a proposal that the Universe was created by the Word of God (or Logos in Greek) is not in conflict with a recent review on the Johannine cosmology:

> "The Word is the creator of all things; the apriority; the source of sources; the origin of origins. The creation of the world is itself revelatory; the creation itself bears the stamp of the Word (1.3)."[89]

And it is also consistent with Holman Christian Standard Bible's translation of Revelation 3:14 : "The Amen, the faithful, true Witness, the **Originator** of God's creation…"[90]

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89 Klink III, Edward W. "Light of the World: Cosmology and the Johannine Literature," Chapter 5 in Jonathan T. Pennington & Sean M. McDonough (eds.) Cosmology and the New Testament Theology. London: T&T Clark, 2008. p. 74-89

90 Holman Christian Standard Bible, Free edition obtained at OliveTree BibleStudy App.

But unfortunately there are only a few studies in such a Johannine cosmology in the existing body of literature, and even more fewer is mathematical model based on such a Johannine cosmology. Therefore my proposal may be considered as one early attempt to develop such a mathematical model based on interpretation of Johannine Prolegomena. By doing so, I wish to contribute in better dialogue between theology and scientific world.

Future works

For the time being, there are some remaining works to be done:

a. To find exact solution of Helmholtz equation in spherical case and then compare it with observed data of Early Universe's oscillation.
b. To explain CMBR/WMAP spectrum and anisotropy
c. To explain redshift data
d. To explain the origin of clustering formation of galaxies
e. Etc.

Implications of the proposed research include:

a. It is possible to reconcile scientific findings with biblical teaching in the context of cosmology modeling.
b. It is possible to explain CMBR spectrum from the viewpoint of classical wave equation.
c. It is possible to construct a fractal vibrating string model to study both many large scale as well as micro scale phenomena.
d. Potential implication is to apply unified wave field model governing electromagnetic and gravitational phenomena.[91]

91 Christianto, V. A derivation of GravitoElectroMagnetic (GEM) Proca-type equations in Fractional Space. Prespacetime Journal Vol. 5 No. 5 May 2014, www.prespacetime.com or http://www.vixra.org/author/Victor_Christianto

In short, if the proposed research is approved, then it can open a plethora of new approaches to study cosmology in a whole new perspective.

Conclusion

I have outlined here a new choice for cosmology model, namely that the Universe was created by Logos (Christ in His pre-existence). This is in accordance with the Prolegomena of the Gospel of John, which says that the Logos was there in the beginning (John 1:1).

My proposal is to extend Dr. George Shpenkov's method (he uses the classical wave equation) to become fractal vibrating string. I hypothesize that many phenomena from microscale up to macroscale can be described using *fractal vibrating string*. And it should be noted here that the proposed fractal vibrating string here is different from fractal string theory of Dr. Michel Lapidus, and it is also different from the "standard" string theory (although philosophically speaking, they may have some similarities).

But unfortunately there are only a few studies in such a Johannine cosmology in the existing body of literature, and even more fewer is mathematical model based on such a Johannine cosmology. Therefore my proposal may be considered as an early attempt to develop such a mathematical model based on interpretation of Johannine Prolegomena. By doing so, I wish to contribute in a better dialogue between theology and scientific world.

If the proposed research is accepted, then it can open a plethora of new approaches to study cosmology in a whole new perspective.

Acknowledgement

I would like to thank many colleagues all over the world, who have shared their ideas and knowledge with me over these years. Many thanks go to Prof. Florentin Smarandache (UNM) who has worked

together with me in some books and papers, and also to Dr. George Shpenkov (Poland) who has shared his insightful papers and books. Special thanks to Dr. Xin-an Zhang from China, who has shared his ideas on acoustic model of dark energy, and to Prof. Carlos Castro Perelman (Atlanta - Georgia) and Prof. Matti Pitkanen (Finland) who have given many insights since 2001. And special thanks also go to many scholars and researchers who have discussed my questions in www.researchgate.net. Many thanks also go to Dr. Volodymyr Krashnoholovets (Ukraine), Michael Peck (USA), Prof. Hardev Singh Virk (India) and Prof. Liek Wilardjo (Indonesia) who have written encouraging words. Meanwhile, all of these ideas presented herein are solely my responsibility.

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On Hermeneutics and Its Relation to Science

Victor Christianto*

Abstract

In this letter, I will suggest a new scheme for approaching hermeneutics and its relation to science. I call this scheme *"spectrum of hermeneutics"*. It should be noted that this is only preliminary proposal.

Key Words:

Hermeneutics, relation, spectrum, science.

In a paper written by Yong on relation between science and theology [1], he argues that evangelicals tend to blame science for making progress, leaving Bible alone with its prophets, and Pentecostal's hermeneutics can help to solve this dichotomy. His proposal is that Holy Spirit is helping the believers now as good as people at the earliest church history, and that is the true message of the Gospel. In other words, Yong suggests that it is wrong to ask the Bible something about Creation story etc., as asked by many evangelicals.

* Correspondence: Victor Christianto, Independent Researcher. Email: victorchristianto@gmail.com

Hermeneutics of suspicion is a phrase coined by Ricoeur in order to categorize the "breakthroughs" in science brought by Marx, Freud and Darwin etc. [6]. He suggests that it is because they employed a kind of hermeneutics of suspicion that they could offer a new insight, be it in psychology, economics politics or biology.

Regardless of the question whether Marx's analysis is correct, or Freud's psychoanalysis is the best theory of mental illness or whether Darwin's evolution theory is correct, I will focus only on the hermeneutics that they use, because modern science largely depends on two things: paradigm and hermeneutics. Especially, when it comes to scientific reading on the Bible, a hermeneutics is to be used, like it or not.

Perhaps the first thing we should be suspicious about is hermeneutics of suspicion itself. In other words, although being critical is acceptable such as in historical criticism, if we employ hermeneutics of suspicion, we tend to be hypercritical towards the Bible. Of course, being hypercritical can be unhealthy, because it means that we carry our own excess baggage that is to be critical about everything. So perhaps we can agree that hermeneutics of suspicion should be distinguished from hypercritical or radical hermeneutics [8].

Let us accept the notion of Pentecostals' hermeneutics as promoted by Yong and other Pentecostals scholars such as Gordon Fee [3-4]. But this is just one choice of hermeneutics among many of possible approaches. In addition, Pentecostal's reading of the Bible often put more respect on their experiences rather than correct exegesis [2]. If my interpretation of Yong's paper is correct, most of the time Pentecostals tend to read the Bible in order to get its message for their experiences, like speaking in tongue. Although such Pentecostal hermeneutics has its own advantage, we should also be cautious for a trap of being delusional, i.e., claiming that the Bible means something when it actually does not. In other words, perhaps

we should distinguish between a healthy Pentecostals hermeneutics and delusional hermeneutics.

If we agree with the above distinctions, then perhaps we can think of seven categories of hermeneutics approaches to the Bible as follows:

Description	Critical	Believing	Involvement	Responsibility
Hypercritical (Radical Hermeneutics)	v	x	x	x
Hermeneutics of Suspicion	v	x	x	v
Hermeneutics of Neutrality	v	v	x	v
Hermeneutics of Respect	v	v	v	v
Hermeneutics of Faith	x	v	v	v
Pentecostals Hermeneutics	x	v	v	v
Delusional Hermeneutics	x	v	v	x

I will now suggest a new scheme which I will call "spectrum of hermeneutics". From the above Table, we see that, as a scientist, we have seven choices to approach and read the Bible, and hermeneutics of suspicion is just an option among other options. If one is a Pentecostal, then perhaps he can take Yong's approach to Pentecostals hermeneutics.

But there are other options, such as: hermeneutics of neutrality, hermeneutics of respect and hermeneutics of faith. An evangelical scientist perhaps would prefer hermeneutics of faith, but a scientist of modern physics perhaps can choose hermeneutics of respect or hermeneutics of neutrality.

It should be noted that this is not an extensive review of many hermeneutics approaches in the literature. I believe that the above proposed scheme has practical value, especially for real scientists doing real science. However, one should be cautious before using radical hermeneutics and hermeneutics of suspicion to approach the Bible.

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A Comparative Study of Cosmology Revealed from Christology and Trinitarian Approaches

Victor Christianto*

Abstract

In this essay, the author will compare cosmology models revealed from Christology and Trinitarian approaches. Although there are differences, both Trinitarian and Christological approaches can be a starting point for developing a biblical approach to cosmology. Cosmological models which are built from Trinitarian or Christology have practical-ethical implications, while contrasting big bang cosmology or its derivatives which tend to put a man in a position of helplessness at the cosmic stage. Both approaches may be potentially developed further into a dialogue of religious pluralism.

Keywords

Cosmology, Christology, Trinity, comparative study, religious pluralism.

* Correspondence: Victor Christianto, Independent Researcher. Email: victorchristianto@gmail.com

Introduction

In this essay, I will discuss cosmology as a conceptual framework of the universe, not necessarily these concepts should be confirmed empirically (6). Current mainstream cosmological theories do not mention God and this has been a particular challenge for many Christians (3). However, some Christian thinkers assumed that modern cosmological theories such as the Big Bang are quite close to the biblical doctrine of creation, but not a few who think that the big bang actually replaces the role of God in creation with a random chance process triggered by fluctuations in vacuum. Others argue that the singular point where the universe began to expand need not be equated with the point of creation. Presumably these issues are more in depth than just maintaining the idea of six-day creation, like what most Creationists told us.

The situation with somewhat similar dilemma also arises in the question of the origin of life on Earth, where the classical view, as was proven by Louis Pasteur through experimentation, stating that the origin of life is life (biogenesis), while the latest scientific developments tend to support the idea that life occurs spontaneously from simple chemical reactions, even cutting-edge theory explains the existence of a common ancestor called the Last Universal Common ancestor (LUCA).

Then how should our attitude as Christians in addressing the various dilemmas? This article is an expression of perceived concerns with respect to the direction of the authors of modern cosmology and dilemmas faced by Christians who want to uphold their faith, therefore the writer will try to look at cosmology from the perspective of the Trinity and Christology.

Basically the author agrees with Norris, Jr., that it is necessary to develop a new cosmological paradigm which can provide a response to the modern cosmology (3, p. 185). Dialogue between cosmology

and the Bible (Scripture) is possible and necessary, particularly if we cite the thinking of 6th century Christologians such as St. Maximus the Confessor. According to Paul M. Blowers, Maximus's theology enables us to do: *"scripturalizing" of the cosmos and "cosmologizing" of the Scripture.* (3, p. 199)

Trinitarian Approach to Cosmology

First of all, it must be recognized that there is no well-established concept of Trinitarian cosmology, let alone that has reached the stage of empirical confirmation. Neville also wrote that the idea of the Trinity is always rooted in revelation and speculation at the same time (1). The starting point of the concept of the Trinity is Christology, and a Christology thesis is rooted in the belief that Jesus is the Son of God because He is the Word made flesh (1, p.9). From this it can be drawn a basic idea that the doctrine of the Trinity was originally stems from Christology, particularly the New Testament Christology.

Thus, if we read the Old Testament from the New Testament lens, we see that since in Gen. 1: 1- 2 already called about the role of God (the Father), the Spirit of God was hovering and also the word of God with power (dabar YHWH). If only we can ignore that Genesis was written by a monotheistic Jews, then the mention of these three actors is sufficient for us to say that the forerunner of the Trinitarian cosmology has existed since Genesis. 1. According to the St.

Basil, God the Father is the "primordial cause of everything that has been made," the Son is "the operative cause," and the Holy Spirit is "the perfecting cause." see (2) p. 250.

Indeed, since the fathers of the church, including Irenaeus and Aquinas, Christians generally assumed that the creation of the Bible is the creation of nothing (creation ex nihilo). Irenaeus for example, writes that there is one God the Father is one God, who created

everything from nothing through his Word. He repeatedly wrote about the Father who has created with His two hands (29). Of course, what is meant by the two hands are the Word and the Holy Spirit.

Although Irenaeus explains these concepts to read Gen. 1: 1-4, 26-27 but of course the views were rooted in the apostolic teachings of the risen Christ. In other words, the trinitarian view of Irenaeus actually stems from Christology. One more thing that should be noted, that the term Trinity itself is not yet known in the second century AD (Irenaeus period), because the term was emerging around the third and fourth centuries. So presumably not appropriate for reading Irenaeus from the standpoint of the development of thinking one or two centuries later (34).

In a later development, few people distinguish between social and Latin Trinitarianism, which essentially are as follows: (35):

a. Social Trinitarianism: "three distinct and discrete persons." But this may be more suitable called tritheism, although there are some theologians who see this concept remains as monotheism. For example: Plantinga, (?)
b. Latin Trinitarianism: "three persons in one substance." This model is further developed into a model of psychology by Augustine of Hippo in his De Trinitate (37).

Just for a side note, in a modern version of this psychology model can be linked with the theory of "plural self" (38). Plural self-concept has been studied seriously in modern psychology (39). That is, the human being as God's image also has a complex identity (plural), and that fact is an indirect hint that monotheism complex (Trinity) is more relevant than the simple monotheism.

However, Karl Rahner has addressed some of the problems that exist with the psychological model of the Trinity, and he prefers to

use the term "hypothesis." See (38a). Furthermore, for a discussion of modern thinking about the Trinity in relation to postmodernism, see for example (18).

Back to the biblical narrative of creation, the actual theory of creation out of nothing is not the only possibility, because there are several possible alternative interpretations of the Genesis 1 narrative. See for example (13):

- creation from 'primordial chaos': if "tohu wa bohu" can be interpreted as chaotic and formless
- creation from a kind of primordial fluid
- continuous creation (creatio continuans): Robert Millikan
- cyclic universe: Roger Penrose
- continuously expanding universe since infinite time: Fred Hoyle
- and one more possibility: creation without singularity.

Some Problems with the Big Bang Model

If one can develop a theory in accordance with cosmological observation data but without involving the singularity hypothesis, then it means the big bang (big bang) become irrelevant. From a theological perspective, Aquinas argued that the existence of God does not implicitly suggest that the age of the universe is limited, and this position is supported for example by Arthur Peacocke and Ian Barbour, see (6). In other words, the big bang theory is not a necessary condition for evidence of the presence of God.

The author also found the idea of the Big Bang bit corny, even if Georges Lemaitre connected it to the "creation ex nihilo." Although there are many writers who have been denied the big bang theory, such as Fred Hoyle, Geoffrey Burbidge and Halton Arp, here the author would only give 3 refutations by elementary logic, namely:

a. First: There is no sane person would build a house by blowing up a pile of bricks with a grenade. In essence, very, very small chance that all the order and structure that we observe in the universe is the result of purely random process. In other words, the big bang models have serious logical flaw.

b. Second: Careful calculations show that if the big bang happened because of fluctuations in the vacuum (Vacuum Fluctuation), then the implication is the cosmological constant would have a value of more than 10 ^ 10 times greater than the observed value now. So it is clear that the assumption of many scientists that the big bang was triggered by fluctuations in vacuum would be simply an unfounded assumption. (Indeed, lately the hypothesis that the big bang came from vacuum fluctuations much to gain followers, especially those who argue that the universe started from nothing; but the essence of their argument is that the Universe did not require a Creator or God, see ref. (40)).

c. Big Bang Theory has a primary assumption is that the universe began from a very small primordial egg. This hypothesis of cosmic egg was first proposed by Georges Lemaitre, based on the findings of Edwin Hubble, an American astronomer. If the law of Hubble is extrapolated backwards it will be found the starting point of the universe. The starting point is what is called a singularity or big bang (15). The question is: what if it can be shown that the singularity is not necessary to explain astronomical data?

Unfortunately, the big bang theory is already widely accepted as an indisputable fact, or in terms of Lakatos: research program (research program). As a result, almost all the paper that criticized the theory will necessarily be rejected in any scientific journal, because it does not comply with accepted research program as a consensus.

It shows the repression of the authority of science worldwide; see ref. (15). Even Fred Hoyle once called the big bang as "religious fundamentalism"(6). For further discussion, for example the readers can see a website by Eric Lerner: www.bigbangneverhappened.org

However, thankfully lately there are also some cosmologists who propose cosmological models without singularities. Of their courage to break down a well-worn theory should be appreciated. See example ref. (16).

In the context of Gen. 1, the universe could be considered to be eternal, but the earth and the solar system were created from a kind of primordial oceans. Theologically, God always be dynamically Trinity in eternity, and this topic has been appointed as the dissertation by Adrian Langdon (19).

Another approach taken rampant among experimental physicists is trying to look at what happened before the big bang, though of course the levels of speculation this approach is quite large (17).

Christology Approach to Cosmology

One of the most striking things in the Hymn of Jesus is the Logos who became flesh. Although there are similarities between these notions to the concept of Logos as a rule or immutable laws that govern the various changes in the universe (such as Heraclitus, the Stoics, and Philo), there are many significant differences between them (3, p. 186-287).

In the Hymn of Jesus, the Logos is personal, consubstantial with the Father, begotten by the Father, and incarnated into human and descended into the world and entered into human history. So instead of a human becomes divine, but instead of a divine being human. Regarding the question of whether the worship of Jesus as the Son of God, Kurios, and the Logos was emerging at a later stage, or indeed

a unique original belief of the early Church, can be seen in the work of James Dunn (43).

Although the view of the cosmos in the light of Christology is most clearly evident in John 1: 1-14, but there's also Paul's writings that discuss the cosmic Christology, for example Col. 1: 15-17. Because it is alleged that the cosmic Christology of John's version has closeness in conceptual with cosmic version of Paul's Christology. In fact, according to John Gibbs, Cosmic Christology is at the core of Paul's conception of the divinity of Jesus, which is no less important than the theology of the cross. It should be noted that Paul's concept of the divinity of Jesus is not from Hellenism, but rooted in the tradition of the early church itself. The combined evidence from various sources indicates that the work of the cosmic Christ is not less essential to the Christology of Paul than the redemptive work of Christ (4, p. 479).

The question then is: is it possible to develop Christological Cosmology from a theological-scientific discourse into an emancipatory science?

In my opinion, there are some things that can be drawn from the Hymn of Jesus (Jn. 1:14), of which:

a. The Word and God the Father has an eternal existence and unity. The implication is the Word and the Father's identities are relational.
b. The Word is the source of life for humans.
c. The Word is the light of the world, and the darkness cannot beat it.
d. The Word was already willing to go down into the world and into the meat (sarx), which is Jesus Christ.
e. The Word of God is very involved in the process of creation of the universe (cosmos). And without Him nothing is finished in all of creation.

Of those phrases, then obviously there is a clash between the Word that is bright with a dark world. So the assumption of dialectical history is not true that says that advances in human civilization happened as a result of multiple-collisions between thesis and antithesis (Hegel). The truth is always conflict because the eternal dark world tends to reject the Light. Thus, the progress of civilization occurs because the Light itself which gives light unto the darkness of the world, so the world is gradually transformed into increasingly bright. This may conceivably be similar to the process of *diffusion* or *osmosis*.

The clear implication here is that those who were chosen to be the children of God are also called to take part in the world, with a variety of functions, among others:

- creation functions: creating order back,
- enlighten the darkness of the world who do not know God,
- restore order amid the chaos of the world (returning order),
- a witness for Christ, the Word
- sew dark world and full of suffering (rather close to the principle of *"tikkun olam"* which held the Jewish community).

Conclusions

Although there are differences, both Trinitarian and Christological approaches can be a starting point for developing a biblical approach to cosmology. Cosmological models which are built from Trinitarian or Christology have practical-ethical implications, while contrasting big bang cosmology or its derivatives which tend to put a man in a position of helplessness at the cosmic stage. Both approaches may be potentially developed further into a dialogue of religious pluralism.

The author is not advocating Social Gospel (Social Gospel). But at least the church can begin to actively build intense communication

with the public, for example by means of open dialogue on theological issues in the public sphere. A dialogic interaction can emerge opportunity to exchange an understanding of the Trinity, Christology and others with other religious communities. Such a dialogue should be taken though certainly not make everyone converted in one go. In Jn. 7:14-8:59 narrated that Jesus also often communicated openly with the Jews even if the results are disappointing.

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A Theo-Cymatic Reading of Prolegomena of St. John's Gospel

Victor Christianto*

Abstract

The science of cymatics, the study of visible sound, is beginning to yield clues to one of the most challenging questions in science: what triggered the creation of life on earth? The hypothetical model we have developed was inspired by ancient traditions and demonstrates that sound and cymatic forces could have worked together to become the dynamic force that created the first stirrings of life and also the Universe.

Keywords

Science, cymatics, sound, creation, Universe, God.

John 1:1-5

1. *In the beginning was the Word, and the Word was with God, and the Word was God.*
2. *The same was in the beginning with God.*

* Correspondence: Victor Christianto, Independent Researcher. Email: victorchristianto@gmail.com

3. *All things were made by him; and without him was not anything made that was made.*
4. *In him was life; and the life was the light of men.*
5. *And the light shineth in darkness; and the darkness comprehended it not.*

Prologue

Spiritual traditions from many cultures speak of sound as having been responsible for the creation of life.

For instance, the Celts of old believed that the world was upheld and sustained by a single all-embracing melody: "Oran Môr," they called it, the Great Music, and all creation was part of it. Perhaps this is why Celtic music possesses the power to move us in unexpected ways - it touches that place deep in our hearts where legends still live, and we hear again the strains of the Ancient Song (2).

The words of St. John's gospel are also a good example (3):

> "In the beginning the Word already existed. The Word was with God, and the Word was God." ['Word' meaning 'sound']

The science of cymatics, the study of visible sound, is beginning to yield clues to one of the most challenging questions in science: what triggered the creation of life on earth? The hypothetical model we have developed was inspired by ancient traditions and demonstrates that sound and cymatic forces could have worked together to become the dynamic force that created the first stirrings of life and also the Universe (3).

The proposed model discussed herein may resonate with the concept of harmony of the spheres as outlined in Johannes Kepler's first monumental work: "Mysterium Cosmographicum" (22).

A theo-cymatic interpretation of John 1:1

Cosmic Christology is a basic Christian doctrine that was often debated during the past 40 years. Cosmic Christology is deeply related with the Cosmic Christ who is the universal but inclusive Savior (6).

The biblical teaching on Cosmic Christology was a legacy of the faith of the Early Church, and this teaching was told in Jesus hymn in the Johannine prologue and the prologue of St. Paul's letter to Colossians (John 1:1-18; Col. 1:15-20), see also Christ hymn in letter to Philippians 2:6-11.

Besides, there are also some texts which were often cited from the Old Testament; these texts indicate the personified Wisdom of God, who acts as the agent of creation. And this character was then used for Jesus Christ. (Proverbs 8:22-31; Wisdom of Solomon 8:4-6; Sirakh 1:4-9). There are also extra-biblical sources which can be referred to, such as "the Son of God" text of Qumran (Bereh di El, 4Q246). Such a text indicates that there was a kind of messianic hope of Essene people, and that hope was very close to the faith of Early Church toward Jesus Christ.

Several implications

That is why, one of my focus of research in the past 3 years until now was to find implications of Cosmic Christology in the context of physics and cosmology. That idea was motivated by the fact that there has been a serious tension between science and theology, after they were separated especially since Galileo Galilei was put into isolation by the Church. One of the books which has inspired me was by Tollefsen which discusses Christocentric Cosmology. See Thorstein Theodor Tollefsen: The Christocentric Cosmology of St. Maximus the Confessor (8).

My investigation has led to several hypotheses, five of them will be discussed shortly below:

(a) Jesus Christ is the Word of God, and He is the agent of God during the creation of the Universe. Because word means voice, and voice means sound, and sound means wave and frequency, then this thought led us to a hypothesis of the existence of primordial sound in the early time of creation (6). It is known by many cosmologists that there is abundance of relic cosmic sound wave from early epoch of creation. Perhaps such a primordial sound will be verified later by Cosmic microwave background radiation observation (CMBR). See for example (11).

(b) Another thought is that (electromagnetic) wave and frequency are very influential to begin each life of creatures. It appears that such a hypothesis was supported by experiments carried out by Prof. Luc Montagnier et al on the wave nature of DNA; (13)(14).

(c) That tought on the wave nature of the Universe also led to a wave model of superconductor electrodynamics. In physics, conductor is matter which can transmit electric current, while superconductor is matter which can transmit electric current at zero resistance. My hypothesis on superconductor electrodynamics has been discussed in a paper published last year in IJET (10).

(d) Frequency may also be used to develop a novel approach of cancer therapy (12).

(e) The light particle which was dubbed as photon has also the wave character. The photon wave can be loaded with information (bits), and according to some experiments on lab, such a method is potentially capable to improve the wireless internet capacity significantly, possibly at the order of 100-160 Gigabits per second. But this method needs to be developed further before it can be used as practical technology (15).

Conclusion

For further discussion, there is my recent book discussing a new cosmology model starting from a fractal vibrating string (fractal vibrating string is fractal generalization of classical wave equation of sound). See (5).

The basic idea of this book is that it is possible to develop a new cosmology model inspired by Cosmic Christology. In other words, Christology is not a separate matter from science. From Christology as starting point, I began to develop various approaches based on wave physics, which I call: "fractal vibrating string." Through this new cosmology model, I wish to offer a new path for dialogue between science and theology. Moreover, it offers a new and fresh approach to understand the bible in this modern time.

I also wish that I already presented my interpretation on Cosmic Christology based on the Johannine prologue, albeit not a complete one.

As a last remark, allow me to cite Psalm 19:1-3 (KJV):

1. The heavens declare the glory of God; and the firmament sheweth his handywork.
2. Day unto day uttereth speech, and night unto night sheweth knowledge.
3. There is no speech nor language, where their voice is not heard.

May God be with you. Soli Deo Gloria.

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Thinking Out Loud on Primeval Atom, Big Bang & Biblical Account of Creation

Victor Christianto*[1] & Florentin Smarandache[2]
[1]Malang Institute of Agriculture, Malang, Indonesia,
email: victorchristianto@gmail.com
[2]Dept. Math. & Sci., Univ. of New Mexico, Gallup, USA.
Email: smarand@unm.edu

Abstract

In recent years, the Big Bang as described by the Lambda CDM-Standard Model Cosmology has become widely accepted by majority of physics and cosmology communities. Some people even have concluded that it has no serious alternative in horizon. Is that true? First, as we argued elsewhere, Big Bang relies on singularity, so, when we are able to describe the observed data without invoking singularity, then Big Bang model is no longer required. In this paper, we explore a few alternatives other than Big Bang which most cosmologists

* Correspondence: Victor Christianto, Independent Researcher. Email: victorchristianto@gmail.com

believe is the closest to biblical account of creation. We argue that re-reading of Genesis 1:2 will lead one to another viable model, albeit it has not been developed rigorously as LCDM theories. We also briefly discuss a fluid Maxwell equations of Tsutomu Kambe based on vortex sound theory.

Keywords

Electromagnetic theory, Maxwell, fluid, singularity-free, cosmology model, vortex sound theory, early Universe, Genesis, Spirit, Creation.

1. Introduction

One of the biggest mysteries in cosmogony and cosmology studies is perhaps: *How to interpret properly Genesis* chapter 1:2. Traditionally, philosophers proposed that God created the Universe out of nothingness (from reading "empty and formless" and "bara" words; this contention is called *"creation ex nihilo*."). Understandably, such a model can lead to various interpretations, including the notorious "cosmic egg" (primeval atom) model as suggested by Georges Lemaitre, which then led to Big Bang model. [18-20] Subsequently, many cosmologists accept it without asking, that Big Bang stands as the most faithful and nearest theory to Biblical account of creation. But we can ask: Is that cosmic egg model the true and faithful reading of Genesis 1:2?

In the subsequent chapter we will discuss how to answer this question by the lens of hermeneutics of Sherlock Holmes. This is a tool of mind which we think to be a better way compared to critical hermeneutics.

Now a word on the meaning of thinking out loud phrase. What we mean with this phrase is, according to a definition:

> **Thinking out loud** is the act of expressing in recoverable and external form new thoughts which you encourage your mind into exploring. Often these lead to new avenues of thought. When you **think out loud** you detect and explore ideas and concepts which are either unknown, or as yet unexplored.[92]

2. Several different interpretations of Genesis 1:2 & implications

Our discussion starts from the fundamental question that one of us (VC) has heard around three years ago (January 2015). At the time, he (VC) had a good time of converation with a senior pastor who happens to be one of the most leading scholars from Jakarta Theology and Philosophy Seminary, i.e. Dr. Joas Adiprasetya (JA). VC tried to explain to him his idea on interpreting of Prolegomena of John Gospel as one of reliable biblical account of creation. In essence, VC told JA that it appears possible to interpret the Logos (in John 1:1) as the Sacred Voice of God, then from voice we can infer sound wave, then from sound wave we can infer frequency. Therefore, we can infer that there should be primordial/relic sound wave which emerged at the earliest time of creation. [10-13] And Prof. Wayne Hu & Martin White has written a paper about observation of such relic sound wave.[21]

But JA asked him (VC): okay, then where was the role of Holy Spirit in that creation story based on John 1:1? VC should admit that at the time he cannot come up with a convincing answer. He only said: "I do not think of that yet."

And it took around three years before now we have been thinking this problem out loud, and here our answer can be summarized

92 wiki.c2.com/?ThinkingOutLoud

as follows: "The relic sound wave in early creation is a faithful interpretation of John 1:1, but we can come up with a more complete picture if we combine it with Gen. 1:2, that is the Holy Spirit came to hovering over the primordial fluid, then a kind of hurricane/storm started which created perfect medium where God spoke (Logos)."

Let us consider some biblical passages:

- What is *Hermeneutics of Sherlock Holmes*?

  One article suggests:[93]

  Holmes: "I have no data yet. It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts."

  Far too often students of the Bible (and cosmology folks as well) twist verses to suit interpretations instead of formulating interpretations to suit what the verses say. Guide: Don't approach your passage assuming you know what it means. Rather, use the data in the passage – the words that are used and how they fit together – to point you toward the correct interpretation.

- A re-reading of Gen. 2:7 with Hermeneutics of Sherlock Holmes[94]

  If we glance at Gen. 2: 7, we see at a glance that man is made up of the dust of the ground (*adamah*) which is breathed by the breath of life by God (*nephesh*). Here we can ask, does this text really support the Cartesian dualism view?

  We do not think so, because the Hebrew concept of man and life is integral. The bottom line: it is not the spirit trapped in the body (Platonic), but the body is flowing in the ocean of spirit. [7]

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93 https://www.str.org/blog/learning-hermeneutics-from-holmes

94 Check Eric McKiddie's article: https://www.thegospelcoalition.org/blogs/trevin-wax/10-tips-on-solvingmysterious-bible-passages-from-sherlock-holmes/

Let's look at three more texts:

a. Gen. 1: 2, *"The earth is without form and void, darkness over the deep, and the Spirit of God hovering over the waters."* Patterns such as Adam's creation can also be encountered in the creation story of the universe. Earth and the oceans already exist (similar to *adamah*), but still empty and formless. Then the Spirit of God hovered over it, in the original text *"ruach"* can be interpreted as a strong wind (storm). So we can imagine there is wind/hurricane, then in the storm that God said, and there was the creation of the universe. See also Amos Yong [6], also Hildebrandt [15]. From a scientific point of view, it is well known in aerodynamics that turbulence can cause sound (*turbulence-generated sound*). And primordial sound waves are indeed observed by astronomers.

b. Ps. 107: 25, "*He said, he raised up a storm that lifted up his waves*." The relation between the word (sound) and the storm (turbulence) is interactive. Which one can cause other. That is, God can speak and then storms, or the Spirit of God causes a storm. Then came the voice.

c. Ezekiel. 37: 7, "*Then I prophesy as I am commanded, and as soon as I prophesy, it sounds, indeed, a crackling sound, and the bones meet with one another."* In Ezekiel it appears that the story of the creation of Adam is repeated, that the Spirit of God is blowing (storm), then the sound of the dead bones arises.

The conclusion of the three verses above seems to be that man is made up of adamah which is animated by the breath or Spirit of God. He is not matter, more accurately referred to as spirit in matter. Like a popular song around 80s goes: *"We are spirits in the material world."*

3. A physical model of turbulence-generated sound for early Universe

Our discussion starts from the fundamental question: how can we include the rotation in early Universe model? After answering that question, we will discuss how "turbulence-generated sound" can be put into a mathematical model for the early Universe. We are aware that the notion of turbulence-generated sound is not new term at all especially in aerodynamics, but the term is rarely used in cosmology until now. We shall show that 3D Navier-Stokes will lead to non-linear acoustics models, which means that a turbulence/storm can generate sound wave.

a. How can we include rotation in early Universe model?

It has been known for long time that most of the existing cosmology models have singularity problem. Cosmological singularity has been a consequence of excessive symmetry of flow, such as "Hubble's law". More realistic one is suggested, based on Newtonian cosmology model but here we include the vortical-rotational effect of the whole Universe.

In this section, we will derive an Ermakov-type equation following Nurgaliev [8]. Then we will solve it numerically using Mathematica 11.

After he proceeds with some initial assumptions, Nurgaliev obtained a new simple local cosmological equation:[8][9] ,

$$\dot{H} + H^2 = \omega^2 + \frac{4\pi G}{3}\rho, \quad (1)$$

where $H = dH / dt$.

The angular momentum conservation law $\omega R^2 = \text{const} = K$ and the mass conservation law $(4\pi/3)\rho R^3 = \text{const} = M$ makes equation (5) solvable:[9] ,

$$\dot{H} + H^2 = \frac{K^2}{R^4} - \frac{GM}{R^3}, \quad (2)$$

or

$$\ddot{R} = \frac{K^2}{R^3} - \frac{GM}{R^2}. \quad (3)$$

Equation (3) may be written as Ermakov-type nonlinear equation as follows;

$$\ddot{R} + \frac{GM}{R^2} = \frac{K^2}{R^3}. \quad (4)$$

Nurgaliev tried to integrate equation (3), but now we will solve the above equation with Mathematica 11. First, we will rewrite this equation by replacing GM=A, K^2=B, so we get: .

$$\ddot{R} + \frac{A}{R^2} = \frac{B}{R^3}. \quad (5)$$

As with what Nurgaliev did in [8][9], we also tried different sets of A and B values, as follows:

a. A and B < 0

```
A=-10;
B=-10;
ODE=x''[t]+A/x[t]^2-B/x[t]^3==0;
sol=NDSolve[{ODE,x[0]==1,x'[0]==1},x[t],{t,-10,10}]
Plot[x[t]/.sol,{t,-10,10}]
```

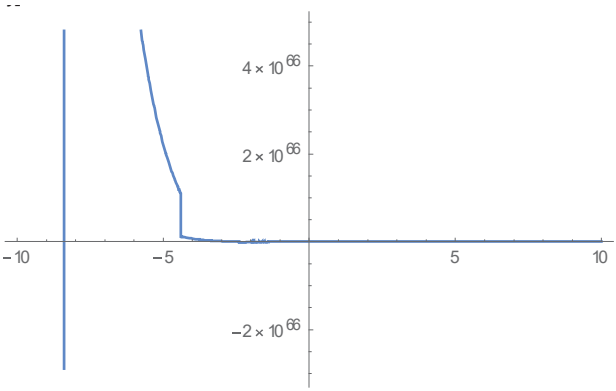

Figure 1. Plot of Ermakov-type solution for A=-10, B=-10

b. $A > 0, B < 0$

```
A=1;
B=-10;
ODE=x''[t]+A/x[t]^2-B/x[t]^3==0;
sol=NDSolve[{ODE,x[0]==1,x'[0]==1},x[t],{t,-10,10}]
        Plot[x[t]/.sol,{t,-10,10}] 10 5 5 10
```

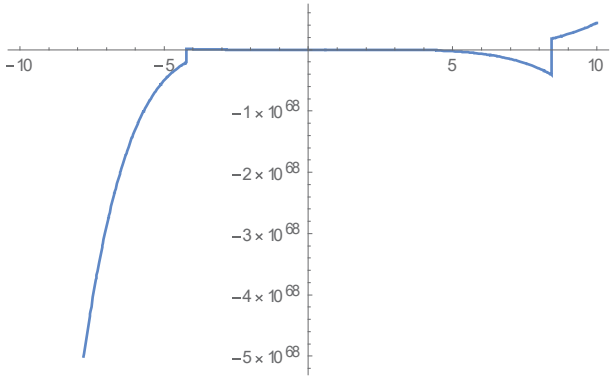

Figure 2. Plot of Ermakov-type solution for A=1, B=-10

From the above computational experiments, we conclude that the evolution of the Universe depends on the constants involved, especially on the rotational-vortex structure of the Universe. This needs to be investigated in more detailed for sure.

One conclusion that we may derive especially from Figure 2, is that our computational simulation suggests that it is possible to consider that the Universe has existed for long time in prolonged stagnation period, then suddenly it burst out from *empty and formless* (Gen. 1:2), to take its current shape with observed "accelerated expansion."

As an implication, we may arrive at a precise model of flattening velocity of galaxies without having to invoke *ad-hoc* assumptions such as dark matter.

Therefore, it is perhaps noteworthy to discuss briefly a simple model of galaxies based on a postulate of turbulence vortices which govern the galaxy dynamics. The result of Vatistas' model equation can yield prediction which is close to observation, as shown in the following diagram:[14]

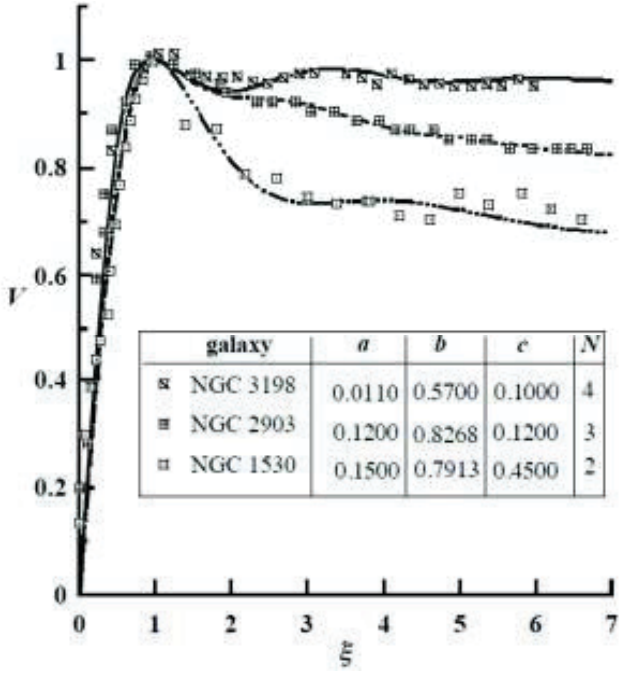

Figure 3. From Vatistas [14]

Therefore, it appears possible to model galaxies without invoking numerous ad hoc assumptions such as *dark matter*, once we accept the existence of turbulent interstellar medium. The Vatistas model is also governed by Navier-Stokes equations, see for instance [14].

b. How "turbulence-generated sound" can be put into a mathematical model for the early Universe

We are aware that the notion of turbulence-generated sound is not new term at all especially in aerodynamics, but the term is rarely used in cosmology until now. We will consider some papers where it can be shown that 3D Navier-Stokes will lead to non-linear acoustics models, which means that a turbulence/storm can generate sound wave.

In this section we consider only two approaches:

- Shugaev-Cherkasov-Solenaya's model: They investigate acoustic radiation emitted by three-dimensional (3D) vortex rings in air on the basis of the unsteady Navier–Stokes equations. Power series expansions of the unknown functions with respect to the initial vorticity which is supposed to be small are used. In such a manner the system of the Navier–Stokes equations is reduced to a parabolic system with constant coefficients at high derivatives. [16]
- Rozanova-Pierrat's Kuznetsov equation: she analysed the existing derivation of the models of non-linear acoustics such as the Kuznetsov equation, the NPE equation and the KZK equation. The technique of introducing a corrector in the derivation ansatz allows to consider the solutions of these equations as approximations of the solution of the initial system (a compressible Navier-Stokes/Euler system). The direct derivation shows that the Kuznetzov equation is the first order approximation of the Navier-Stokes system, the KZK and NPE equations are the first order approximations of the Kuznetzov equation and the second order approximations of the Navier-Stokes system. [17]

4. Vortex-sound theory and fluidic Maxwell equations

There are a number of proposals to revise Maxwell equations. But few has considered a fresh starting point with regards to the (sub-)structure of aether. It is very interesting to note that Prof. T. Kambe from University of Tokyo has made a connection between the equation of vortex-sound theory and its analogue fluid Maxwell equations. He wrote that it would be no exaggeration to say that any vortex motion excites *acoustic* waves. [2]

He considers the equation of vortex sound of the form: [2].

$$\frac{1}{c^2}\partial_t^2 p - \nabla^2 p = \rho_0 \nabla . L = \rho_0 div(\omega \times v) \quad (6)$$

He also wrote that dipolar emission by the vortex-body interaction is:[2] 2

$$p_F(x,t) = -\frac{P_0}{4\pi c}\dot{\Pi}_i(t - \frac{x}{c})\frac{x_c}{x^2} \quad (7)$$

Then he obtained an expression of fluid Maxwell equations as follows [2]:

$$\nabla \cdot H = 0$$
$$\nabla \cdot E = q$$
$$\nabla \times E + \partial_t H = 0$$
$$a_0^2 \nabla \times H - \partial_t E = J \quad (8)$$

Where [2]:

a_0 denotes the sound speed, and

$$q = -\partial_t(\nabla \cdot \upsilon) - \nabla \hbar,$$
$$J = \partial_t^2 v + \nabla \partial_t h + a_o^2 \nabla \times (\nabla \times \upsilon) \quad (9)$$

In our opinion, this new expression of fluid Maxwell equations suggests that there is a deep connection between vortex sound and electromagnetic fields.

However, it should be noted that the above expressions based on fluid dynamics need to be verified with experiments. We should note also that in (8) and (9), the speed of sound a0 is analogous of the speed of light in Maxwell equations, whereas in equation (6), the speed of sound is designated "c" (as analogous to the light speed in EM wave equation).

As an added note, we can mention here that elsewhere Wang [5] was able to derive Coulomb law from the source-sink approach. We are wondering if it is also possible to re-derive Maxwell equations

including displacement current from the same approach. If yes, then it may offer another fresh starting point to understand the physical meaning of displacement current.

5. Conclusions

In recent years, there is growing number of proposals to use a novel concept of singularity-free Cosmology models. It should be clear that if we are able to come up with such singularity-free models which agree well with observation data, then the Big Bang model is no longer required. Therefore, here we explore a few alternative stories other than Big Bang story, which most cosmologists believe it is the nearest to Biblical account of creation (as Fred Hoyle once remarked: the Big Bang is a fanatical religion).

We argue that a re-reading of Genesis 1:2 will lead us to another viable story, albeit the alternative has not been developed rigorously as LCDM theories.

> It took around three years before now we have been thinking this problem out loud, and here our answer can be summarized as follows: *"The relic sound wave in early creation is a faithful interpretation of John 1:1, but we can come up with a more complete picture if we combine it with Gen. 1:2, that is the Holy Spirit came to hovering over the primordial fluid, then a kind of hurricane/storm started which created perfect medium where God spoke (Logos)."*

And one conclusion that we may derive especially from Figure 2, is that our computational simulation suggests that it is possible to consider that the Universe has existed for long time in prolonged stagnation period, then suddenly it burst out from *empty and formless (Gen. 1:2)*, to take its current shape which is accelerating. Such a possibility has never been considered before in cosmology literatures.

We also briefly discuss a plausible extension of Maxwell equations based on vortex sound theory of Tsutomu Kambe. It is our hope that our exploration will lead to nonlinear cosmology theories which are better in terms of observations, and also more faithful to Biblical account of creation.

Acknowledgment

The first author would like to express his thanks to Dr. Joas Adiprasetya, Dr. Yonky Karman, and Dr. Wonsuk Ma for discussions on early creation of the Universe. We also thank to a number of professors in physics, including Prof. Liek Wilardjo and Prof. Thee Houw Liong. *May God be with you*.

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CONCLUDING REMARKS

In this dissertation draft, I tried to give an outline of psychosynthesis which can be considered as extension of Jung's personality model. Then I worked out a socio-economics model which emphasizes the role collective actions and collective emotions.

In other paper, I argue how we can solve Olson's collective action problem in digital pervasive network.

I also worked out an outline how Lotka-Volterra equation can play role in cosmology theorizing.

In terms of observational testability, allow me to quote from the first paper in Part II:

A short note on plausibility of experimental vindication of the proposed model

These authors just think of plausible vindication of the proposed intermediate state of fermion-boson, which may be called "ferson". It may have a chance to get into real observation at CERN etc.

Yes, it may be interesting for particle physicists who wish to continue the service period of CERN expensive facilities after discovery of Higgs particle. As the readers may already know, they tried to extend standard model to supersymmetry but it failed to come to detectors.

Meanwhile, we just read that there are (at least) two possible theories which seem correspond to an intermediate statistics we're looking for: (a) anyon fractional statistics by Franck Wilczek, which we are not sure, (b) G. Gentile'sstatistics which predict the existence of "intermediate particle" between fermion and boson, but nobody

has identified any experimental result with such an intermediate particle so far.

So, allow us to suggest interested readers to read and examine Giovani Gentile Jr.'s original paper in Nuovo Cimento (1940).[95]

As a last word of this dissertation, allow us to quote from Bob Marley:

Redemption Song

Bob Marley

Emancipate yourselves from mental slavery
None but ourselves can free our minds
Have no fear for atomic energy
'Cause none of them can stop the time
How long shall they kill our prophets
While we stand aside and look? Ooh
Some say it's just a part of it
We've got to fulfill the Book
Won't you help to sing
These songs of freedom?
'Cause all I ever have
Redemption songs
Redemption songs
Redemption songs
Emancipate yourselves from mental slavery
None but ourselves can free our minds
Wo! Have no fear for atomic energy
'Cause none of them-a can-a stop-a the time
How long shall they kill our prophets
While we stand aside and look?
1 https://www.luisabonolis.it/Giovanni_Gentile_Jr_files/
GentileCronoFoto.pdf
Yes, some say it's just a part of it
We've got to fulfill the Book
Won't you have to sing

95 https://www.luisabonolis.it/Giovanni_Gentile_Jr_files/GentileCronoFoto.pdf

These songs of freedom?
'Cause all I ever had
Redemption songs
All I ever had
Redemption songs
These songs of freedom
Songs of freedom

Songwriters: Bob Marley

Redemption Song lyrics © Kobalt Music Publishing Ltd.

Version 1.0: 17/08/2018

VC

Appendixes

Appendix I: A derivation of Maxwell equations in Quaternion Space, *Progress in Physics*, April 2010.

Appendix II: *Wireless network security and how to solve collective action problem*. Presentation file to RIEECE/IEEE conference held in India, 4th Aug, 2018

Appendix III: *Gotong-royongers in action* (a few pictures)

Appendix IV: NSIA Certificate

APPENDIX I

A Derivation of Maxwell Equations in Quaternion Space

Vic Chrisitianto* and Florentin Smarandachey †
*Present address: Institute of Gravitation and Cosmology, PFUR, Moscow, 117198, Russia.
E-mail: vxianto@yahoo.com
†Department of Mathematics, University of New Mexico, Gallup, NM87301, USA.
E-mail:smarand@unm.edu

Quaternion space and its respective Quaternion Relativity (it also may be called as Rotational Relativity) has been defined in a number of papers, and it can be shown that this new theory is capable to describe relativistic motion in elegant and straight forward way. Nonetheless there are subsequent theoretical development swhich remains an open question, for instance to derive Maxwell equations in Q-space. Therefore the purpose of the present paper is to derive a consistent description of Maxwell equations in Q-space. First we consider a simplified method similar to the Feynman's derivation of Maxwell equations from Lorentz force. And then we present another derivation method using Dirac decomposition, introduced by Gersten (1998). Further

observation is of course recommended in order to refute or verify some implication of this proposition.

1. Introduction

Quaternion space and its respective Quaternion Relativity (it also may be called as Rotational Relativity has been defined in a number of papers including [1], and it can be shown that this new theory is capable to describe relativistic motion in elegant and straightforward way. Forinstance, it can be shown that the Pioneer space craft's Doppler shif tanomaly can be explained as a relativistic effect of Quaternion Space [2]. The Yang-Mills field also can be shown to be consistent with Quaternion Space [1]. Nonetheless there are subsequent theoretical development swhich remains an openissue, for instance to derive Maxwell equations in Q-space [1].

Therefore the purpose of the present article is to derive a consistent description of Maxwell equations in Q-space. First we consider as implified method similar to the Feynman's derivation of Maxwell equations from Lorentz force. Then we present another method using Dirac decomposition, introduced by Gersten [6].In the first section we will shortly review the basics of Quaternion space as introducedin [1].

Further observation is of course recommended in order to verify or refute the propositions outlined herein.

2. Basic aspects of Q-relativity physics

In this section, we will review some basic definitions of quaternion number and then discuss their implications to quaternion relativity (Q-relativity) physics [1].

Quaternion number belongs to the group of "very good" algebras: of real, complex, quaternion, and octonion, and normally defined as follows [1]

$$Q \equiv a + bi + cj + dk\,. \quad (1)$$

Where *a, b, c, d* are real numbers, and i, j, k are imaginary quaternion units. These Q-units can be represented either via 2x2 matrices or 4x4 matrices.There is quaternionic multiplication rule which acquires compact form [1]

$$1q_k = q_k 1 = q_k\,, \qquad q_j q_k = -\delta_{jk} + \epsilon_{jkn} q_n\,. \quad (2)$$

Where δ_{kn} and ε_{jkn} represents 3-dimensional symbols of Kronecker and Levi-Civita, respectively.

In the context of Quaternion Space [1], it is also possible to write the dynamics equations of classical mechanics for an inertial observer in constant Q-basis. SO (3,R)-invariance of two vectors allow to represent these dynamics equations in Q-vector form [1]

$$m\frac{d^2}{dt^2}(x_k q_k) = F_k q_k\,. \quad (3)$$

Because of antisymmetry of the connection (generalised angular velocity) the dynamics equations can be written in vector components, by conventional vector notation [1]

$$m\left(\vec{a} + 2\vec{\Omega}\times\vec{v} + \vec{\Omega}\times\vec{r} + \vec{\Omega}\times\left(\vec{\Omega}\times\vec{r}\right)\right) = \vec{F}\,. \quad (4)$$

Therefore, from equation (4) one recognizes known types of classical acceleration, i.e. linear, coriolis, angular, centripetal.

From this view point one may consider a generalization of Minkowski metric interval into biquaternion form [1]

$$dz = (dx_k + idt_k)\, q_k \quad (5)$$

With some novel properties, i.e.:

- time interval is defined by imaginary vector;
- space-time of the model appears to have six dimensions (6D model);
- vector of the displacement of the particle and vector of corresponding time change must always be normal to each other, or

  $dx_k dt_k = 0.$ (6)

One advantage of this Quaternion Space representation is that it enables to describe rotational motion with great clarity.

After this short review of Q-space, next we will discuss a simplified method to derive Maxwell equations from Lorentz force, in a similar way with Feynman's derivation method using commutative relation [3,4].

3. An intuitive approach from Feynman's derivative

A simplified derivation of Maxwell equations will be discussed he reusing similar approach known as Feynman's derivation [3–5].

We can introduce now the Lorentz force into equation (4), to become

$$m\left(\frac{d\vec{v}}{dt} + 2\vec{\Omega}\times\vec{v} + \vec{\Omega}\times\vec{r} + \vec{\Omega}\times\left(\vec{\Omega}\times\vec{r}\right)\right) = \\ = q_{\otimes}\left(\vec{E} + \frac{1}{c}\vec{v}\times\vec{B}\right), \quad (7)$$

or

$$\left(\frac{d\vec{v}}{dt}\right) = \frac{q_{\otimes}}{m}\left(\vec{E} + \frac{1}{c}\vec{v}\times\vec{B}\right) - 2\vec{\Omega}\times\vec{v} - \vec{\Omega}\times\vec{r} - \vec{\Omega}\times\left(\vec{\Omega}\times\vec{r}\right). \quad (8)$$

We note here that q variable here denotes electric charge, not quaternion number.

Interestingly, equation (4) can be compared directly to equation (8) in [3]

$$m\ddot{x} = F - m\left(\frac{d\vec{v}}{dt}\right) + m\vec{r}\times\vec{\Omega} + m2\dot{x}\times\vec{\Omega} + m\vec{\Omega}\times\left(\vec{r}\times\vec{\Omega}\right). \quad (9)$$

In other words, we find an exact correspondence between quaternion version of Newton second law (3) and equation (9), i.e. the equation of motion for particle of mass m in a frame of reference whose origin has linear acceleration a and an angular velocity $\vec{\Omega}$ with respect to the reference frame [3].

Since we want to find out an "electromagnetic analogy" for the inertial forces, then we can set $F = 0$. The equation of motion (9) then can be derived from Lagrangian $L = T - V$, where T is the kinetic energy and V is avelocity-dependent generalized potential [3]

$$V(x,\dot{x},t) = ma\cdot x - m\dot{x}\cdot\vec{\Omega}\times x - \frac{m}{2}\left(\vec{\Omega}\times x\right)^2, \quad (10)$$

Which is a linear function of the velocities. We now may consider that the right hand side of equation (10) consists of a scalar potential [3]

$$\phi(x,t) = ma\cdot x - \frac{m}{2}\left(\vec{\Omega}\times x\right)^2, \quad (11)$$

and avectorpotential

$$A(x,t) \equiv m\dot{x}\cdot\vec{\Omega}\times x, \quad (12)$$

so that

$$V(x,\dot{x},t) = \phi(x,t) - \dot{x}\cdot A(x,t). \quad (13)$$

Then the equation of motion (9) may now be written in Lorentz form as follows [3]

$$m\ddot{x} = E(x,t) + x \times H(x,t) \quad (14)$$

with

$$E = -\frac{\partial A}{\partial t} - \nabla\phi = -m\Omega \times x - ma + m\Omega \times (x \times \Omega) \quad (15)$$

and

$$H = \nabla \times A = 2m\Omega\,. \quad (16)$$

At this point we may note [3, p. 303] that Maxwell equations are satisfied by virtue of equations (15) and (16). The correspondence between Coriolis force and magnetic force, is known from Larmor method. What is interesting to remark here, is that the same result can be expected directly from the basic equation (3) of Quaternion Space [1]. The aforementioned simplified approach indicates that it is indeed possible to find out Maxwell equations in Quaternion space, in particular based on our intuition of the direct link between Newton second law in Q-space and Lorentz force (We can remark that this parallel between classical mechanics and electromagnetic field appears to be more profound compared to simple similarity between Coulomb and Newton force).

As an added note, we can mention here, that the aforementioned Feynman's derivation of Maxwell equations is based on commutator relation which has classical analogue in the form of Poisson bracket. Then there can be aplausible way to extend directly this "classical" dynamics to quaternion extension of Poisson bracket, by assuming the dynamics as element of the type: $r \in H \curlywedge H$ of the type: $r =$

$ai \wedge j + bi \wedge k + c\, j \wedge k$, from which we can define Poisson bracket on H. But in the present paper we don't explore yet such apossibility.

In the next section we will discuss more detailed derivation of Maxwell equations in Q-space, by virtue of Gersten's method of Dirac decomposition [6].

4. A new derivation of Maxwell equations in Quaternion Space by virtue of Dirac decomposition

In this section we present a derivation of Maxwell equations in Quaternion space based on Gersten's method to derive Maxwell equations from one photon equation by virtue of Dirac decomposition [6]. It can be noted here that there are other methods to derive such a "quantum Maxwell equations" (i.e. to find link between photon equation and Maxwell equations), for instance by Barut quite along time ago (see ICTP preprint no. IC/91/255).

We know that Dirac deduces his equation from the relativistic condition linking the Energy E, the mass m and the momentum p [7]

$$\left(E^2 - c^2 \vec{p}^{\,2} - m^2 c^4\right) I^{(4)} \Psi = 0\,, \quad (17)$$

where $I^{(4)}$ is the 4x4 unit matrix and Ψ is a 4-component column (bispinor) wave function. Dirac then decomposes equation (17) by assuming them as a quadratic equation

$$\left(A^2 - B^2\right)\Psi = 0\,, \quad (18)$$

where

$$A = E\,; \quad (19)$$

$$B = c\vec{p} + mc^2. \quad (20)$$

The decomposition of equation (18) is well known, i.e. $(A + B)(A - B) = 0$, which is the basic of Dirac's decomposition method into 2x2 unit matrix and Pauli matrix [6].

By virtue of the same method with Dirac, Gersten [6] found in 1998 a decomposition of one photon equation from relativistic energy condition (for massless photon [7])

$$\left(\frac{E^2}{c^2} - \vec{p}^{\,2}\right) I^{(3)} \Psi = 0\,, \qquad (21)$$

where $I^{(3)}$ is the 3x3 unit matrix and Ψ is a 3-component column wave function. Gersten then found [6] equation (21) decomposes into the form

$$\left[\frac{E}{c} I^{(3)} - \vec{p}\cdot\vec{S}\right]\left[\frac{E}{c} I^{(3)} + \vec{p}.\vec{S}\right]\vec{\Psi} - \begin{pmatrix} p_x \\ p_y \\ p_z \end{pmatrix}\left(\vec{p}\cdot\vec{\Psi}\right) = 0 \quad (22)$$

where $\vec{S}$ is a spin one vector matrix with components [6]

$$S_x = \begin{pmatrix} 0 & 0 & 0 \\ 0 & 0 & -i \\ 0 & -i & 0 \end{pmatrix}, \quad (23)$$

$$S_y = \begin{pmatrix} 0 & 0 & i \\ 0 & 0 & 0 \\ -i & 0 & 0 \end{pmatrix}, \quad (24)$$

$$S_z = \begin{pmatrix} 0 & -i & 0 \\ -i & 0 & 0 \\ 0 & 0 & 0 \end{pmatrix}. \quad (25)$$

and with the properties

$$\left.\begin{aligned} \left[S_x, S_y\right] &= iS_z\,, \quad [S_x, S_z] = iS_y \\ \left[S_y, S_z\right] &= iS_x\,, \quad \vec{S}^2 = 2I^{(3)} \end{aligned}\right\}. \quad (26)$$

Gersten asserts that equation (22) will be satisfied if the two equations [6]

$$\left[\frac{E}{c} I^{(3)} + \vec{p} \cdot \vec{S}\right] \vec{\Psi} = 0, \quad (27)$$

$$\vec{p} \cdot \vec{\Psi} = 0 \quad (28)$$

are simultaneously satisfied. The Maxwell equations [8] will be obtained by substitution of E and p with the ordinary quantum operators (see for instance Bethe, *Field Theory*)

$$E \rightarrow i\hbar \frac{\partial}{\partial t} \quad (29)$$

and

$$p \rightarrow -ih\nabla \quad (30)$$

and the wave function substitution

$$\vec{\Psi} = \vec{E} - i\vec{B}, \quad (31)$$

where E and B are electric and magnetic fields, respectively. With the identity

$$\left(\vec{p} \cdot \vec{S}\right) \vec{\Psi} = \hbar \nabla \times \vec{\Psi}, \quad (32)$$

then from equation (27) and (28) one will obtain

$$i \frac{\hbar}{c} \frac{\partial \left(\vec{E} - i\vec{B}\right)}{\partial t} = -\hbar \nabla \times \left(\vec{E} - i\vec{B}\right), \quad (33)$$

$$\nabla \cdot \left(\vec{E} - i\vec{B}\right) = 0, \quad (34)$$

which are the Maxwell equations if the electric and magnetic fields are real [6,7].

We can remark here that the combination of E and B as introduced in (31) is quite well known in literature [9,10]. For instance, if we use positive signature in (31), then it is known as Bateman representation of Maxwelle quations div $\vec{\epsilon} = 0$, rot $\vec{\epsilon} = \frac{\partial \epsilon}{\partial t}$, $\epsilon = \vec{E} + i\vec{B}$. But the equation (31) with negative signature representsthe complexnature of electromagnetic fields [9], which indicates that these fields can also be represented in quaternion form.

Now if we represent in other form $\vec{\epsilon} = \vec{E} - i\vec{B}$ as more conventional notation, then equation (33) and (34) will get a quite simple form

$$i\frac{\hbar}{c}\frac{\partial \vec{\epsilon}}{\partial t} = -\hbar \nabla \times \vec{\epsilon}, \quad (35)$$

$$\nabla \cdot \vec{\epsilon} = 0. \quad (36)$$

Now to consider quaternionic expression of the above results from Gersten [6], one can begin with the same linearization procedure just as in equation (5)

$$dz = (dx_k + idt_k)\, q_k, \quad (37)$$

which can be viewed as the quaternionic square root of the metric interval dz

$$dz^2 = dx^2 - dt^2, \quad (38)$$

Now consider the relativistic energy condition (formassless photon [7]) similar to equation (21)

$$E^2 = p^2c^2 \Rightarrow \left(\frac{E^2}{c^2} - \vec{p}^{\,2}\right) = k^2. \quad (39)$$

It is obvious that equation (39) has the same form with (38), therefore we may find its quaternionic square root too, then we find

$$k = \left(E_{qk} + i\vec{p}_{qk}\right) q_k \,, \quad (40)$$

where q represents the quaternion unit matrix. Therefore the linearized quaternion root decomposition of equation (21) can be written as follows [6]

$$\left[\frac{E_{qk}\, q_k}{c}\, I^{(3)} + i\vec{p}_{qk}\, q_k \cdot \vec{S}\right]\left[\frac{E_{qk}\, q_k}{c}\, I^{(3)} + i\vec{p}_{qk}\, q_k \cdot \vec{S}\right]\vec{\Psi} - \\ - \begin{pmatrix} p_x \\ p_y \\ p_z \end{pmatrix}\left(i\vec{p}_{qk} q_k \cdot \vec{\Psi}\right) = 0\,. \quad (41) \qquad (41)$$

Accordingly, equation (41) will be satisfied if the two equations

$$\left[\frac{E_{qk}\, q_k}{c}\, I^{(3)} + i\,\vec{p}_{qk}\, q_k \cdot \vec{S}\right]\vec{\Psi}_k = 0\,, \quad (42)$$

$$i\,\vec{p}_{qk}\, q_k \cdot \vec{\Psi}_k = 0 \quad (43)$$

are simultaneously satisfied. Now we introduce similar wavefunction substitution, but this time in quaternion form

$$\vec{\Psi}_{qk} = \vec{E}_{qk} - i\vec{B}_{qk} = \vec{\epsilon}_{qk}\,. \quad (44)$$

And with the identity

$$\left(\vec{p}_{qk}\, q_k \cdot \vec{S}\right)\vec{\Psi}_k = \hbar\,\nabla_k \times \vec{\Psi}_k\,. \quad (45)$$

Then from equations (42) and (43) one will obtain the *Maxwell equations in Quaternion-space* as follows

$$i\frac{\hbar}{c}\frac{\partial\vec{\epsilon}_q k}{\partial t} = -\hbar\nabla_k \times \vec{\epsilon}_{qk}\,, \quad (46)$$

$$\nabla_k \cdot \vec{\epsilon}_{qk} = 0\,. \quad (47)$$

Now there maining question is to define quaternion differential operator in the righthandsideof(46)and(47).

In this regards one can choose some definitions of quaternion dierential operator, for instance the Moisil-Theodoresco operator [11]

$$D[\varphi] = \text{grad}\,\varphi = \sum_{k=1}^{3} i_k \partial_k \varphi = i_1\partial_1\varphi + i_2\partial_2\varphi + i_3\partial_3\varphi\,. \quad (48)$$

where we can define $i_1 = i$; $i_2 = j$; $i_3 = k$ to represent 2x2 quaternion unit matrix, for instance. Therefore the differential of equation (44) now can be expressed in similar notation of (48)

$$D\left[\vec{\Psi}\right] = D[\vec{\epsilon}] = i_1\partial_1 E_1 + i_2\partial_2 E_2 + i_3\partial_3 E_3 - \\ - i\left(i_1\partial_1 B_1 + i_2\partial_2 B_2 + i_3\partial_3 B_3\right), \quad (49)$$

This expression indicates that both electric and magnetic fields can be represented in unified manner in a biquaternion form.

Then we define quaternion dierential operator in the right-hand-side of equation (46) by an extension of the conventional definition of curl

$$\nabla \times A_{qk} = \begin{vmatrix} i & j & k \\ \dfrac{\partial}{\partial x} & \dfrac{\partial}{\partial y} & \dfrac{\partial}{\partial z} \\ A_x & A_y & A_z \end{vmatrix}. \quad (50)$$

To become its quaternion counterpart, where *i; j; k* represents quaternion matrix as described above. This quaternionic extension of curl operator is based on the known relation of multiplication of two arbitrary complex quaternions *q* and *b* as follows

$$q \cdot b = q_0 b_0 - \left\langle \vec{q}, \vec{b} \right\rangle + \left[\vec{q} \times \vec{b} \right] + q_0 \vec{b} + b_0 \vec{q}, \quad (51)$$

where

$$\left\langle \vec{q}, \vec{b} \right\rangle := \sum_{k=1}^{3} q_k b_k \in C, \quad (52)$$

and

$$\left[\vec{q} \times \vec{b} \right] := \begin{vmatrix} i & j & k \\ q_1 & q_2 & q_3 \\ b_1 & b_2 & b_3 \end{vmatrix} \quad (53)$$

We can note here that there could be more rigorous approach to define such a quaternionic curl operator [10].

In the present paper we only discuss derivation of Maxwell equations in Quaternion Spaceusing the decomposition method described by Gersten [6]. Further extension to Proca equations in Quaternion Space seems possible too using the same method [7], but it will not be discussed here.

In the next section we will discuss some physical implications of this new derivation of Maxwell equations in Quaternion Space.

5. A few implications: de Broglie's wave length and spin

In the foregoing section we derived a consistent description of Maxwell equations in Q-Space by virtue of Dirac-Gersten's decomposition. Now we discuss some plausible implications of the new proposition.

First, in accordance with Gersten, we submit the view point that the Maxwell equations yield wave functions which can be used as guide line for interpretation of Quantum Mechanics [6]. The one-to-one correspondence between classical and quantum wave interpretation actually can be expected not only in the context of Feynman's derivation of Maxwell equations from Lorentz force, but also from known exact correspondence between commutation relation and Poisson bracket [3,5]. Furthermore, the proposed quaternion yields to a novel view point of both the wave length, as discussed below, and also mechanical model of spin.

The equation (39) implies that momentum and energy could be expressed in quaternion form. Now by introducing de Broglie's wave length $\lambda_{DB} = \frac{\hbar}{p} \rightarrow p_{DB} = \frac{\hbar}{\lambda}$, then one obtains an expression in terms of wave length

$$k = (E_k + i\vec{p}_k)\, q_k = (E_k q_k + i\vec{p}_k q_k) = \left(E_k q_k + i\, \frac{\hbar}{\lambda_k^{DB} q_k} \right). \quad (54)$$

In other words, now we can express de Broglie's wavelength in a consistent Q-basis

$$\lambda_{DB-Q} = \frac{\hbar}{\sum_{k=1}^{3} (p_k)\, q_k} = \frac{\hbar}{v_{group} \sum_{k=1}^{3} (m_k)\, q_k}, \quad (55)$$

therefore the above equation can be viewed as an extended De Broglie wavelength in Q-space. This equation means that the mass also can be expressed in Q-basis. In the mean time, a quite similar method to define quaternion mass has also been considered else where, but it has not yet been expressed in Dirac equation form as presented here.

Further implications of this new proposition of quaternion de Broglie requires further study, and therefore it is excluded from the present paper.

6. Concluding remarks

In the present paper we derive a consistent description of Maxwell equations in Q-space. First we consider a simplified method similar to the Feynman's derivation of Maxwell equations from Lorentz force. And then we present another method to derive Maxwell equations by virtue of Dirac decomposition, introduced by Gersten [6].

In accordance with Gersten, we submit the view point that the Maxwell equations yield wave functions which can be used as guide line for interpretation of quantum mechanics. The one-to-one correspondence between classical and quantum wave interpretation asserted here actually can be expected not only in the context of Feynman's derivation of Maxwell equations from Lorentz force, but also from known exact correspondence between commutation relation and Poisson bracket [3,6].

A somewhat unique implication obtained from the above results of Maxwell equations in Quaternion Space, is that it suggests that the De Broglie wave length will have quaternionic form. Its further implications, however, are beyond the scope of the present paper.

In the present paper we only discuss derivation of Maxwell equations in Quaternion Space using the decomposition method described by Gersten [6]. Further extension to Proca equations in Quaternion Space seems possible too using the same method [7], but it will not be discussed here.

This proposition, however, deserves further theoretical considerations. Further observation is of course recommended in order to refute or verify some implications of this result.

Acknowledgements

One of the authors (VC) wishes to express his gratitude to Profs. A. Yefremovand M.Fil'chenkov for kind hospitality in the Institute of Gravitation and Cosmology, PFUR. Special thanks also to Prof. V.V. Kassandrov for excellent guide to Maxwell equations, and to Prof. Y.P. Rybakov for discussions on the interpretation of de Broglie's wave length.

Submitted on December 11, 2009 / Accepted on January 02, 2010

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APPENDIX 2

- This is our presentation to RIEECE, held in India this August 4th, 2018.
- Our paper can be summarized as follows: that the coming era of global eavesdroppers will make human being as losers in their own game, replaced with plethora of drones and surveillance technologies.
- In order to save humanity, we should take a slower pace and begin considering collective actions and then doing meaningful work for society.

Wireless internet security and how to solve collective action problem

(Mancur Olson's book)

RIEECE, India, 4 Aug 2018
V. Christianto & F. Smarandache
email: victorchristianto@gmail.com

Our paper

- What we can do to save humanity in the coming era of global eavesdroppers (or The Social Innovation way to solve collective action problem)
- Victor Christianto*,**, & Florentin Smarandache***
- * Malang Institute of Agriculture (IPM), Malang – INDONESIA, email: victorchristianto@gmail.com
- **URL: http://researchgate.net/profile/Victor_Christianto
- *** Dept. Mathematics & Sciences, University of New Mexico, Gallup, USA. Email: smarand@unm.edu

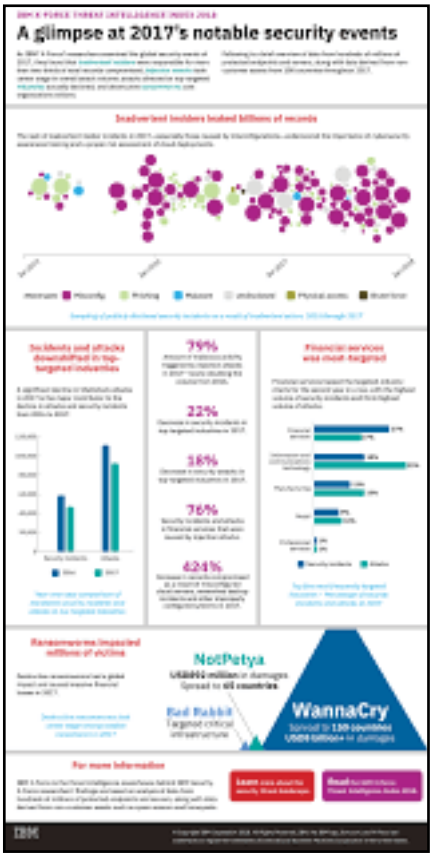
Abstract

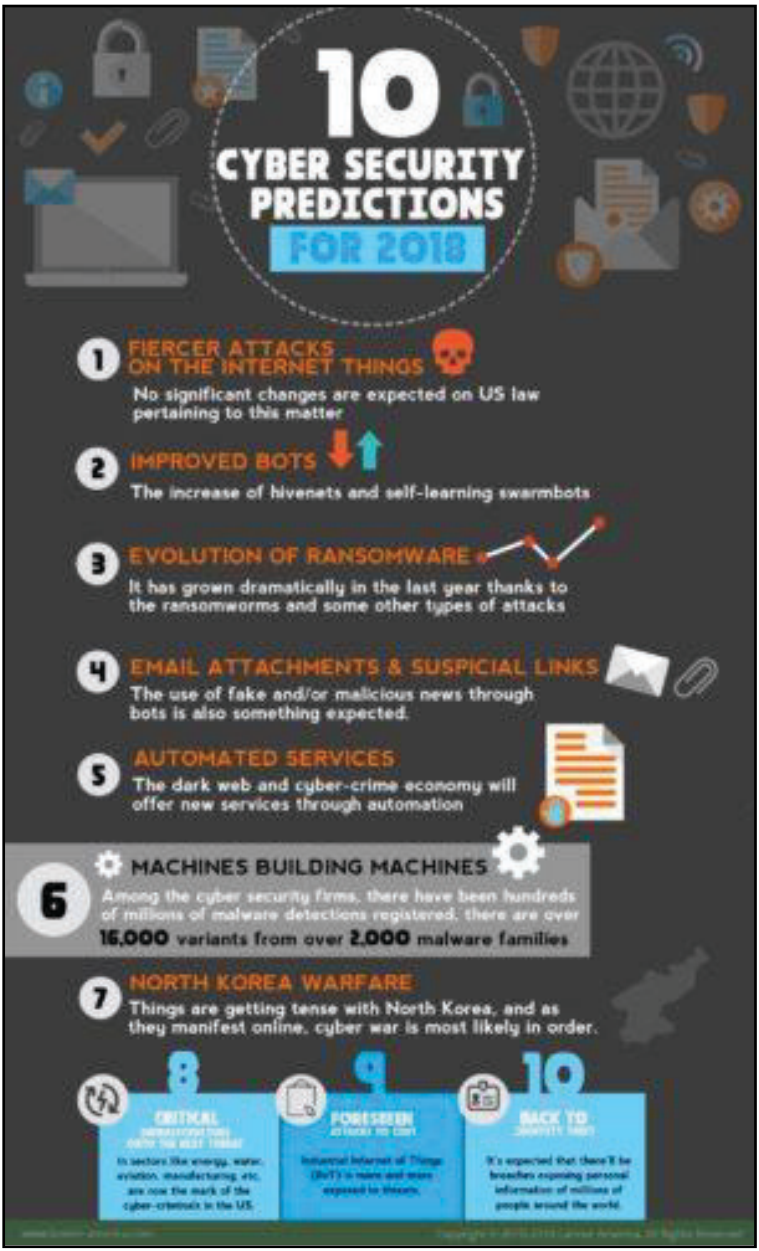
- In this paper, we tried to draw a fair assessment on things which will take place soon with the coming era of IoT, 5G technology, global eavesdroping and all that. Nonetheless, we are aware that this article sounds quite gloomy.

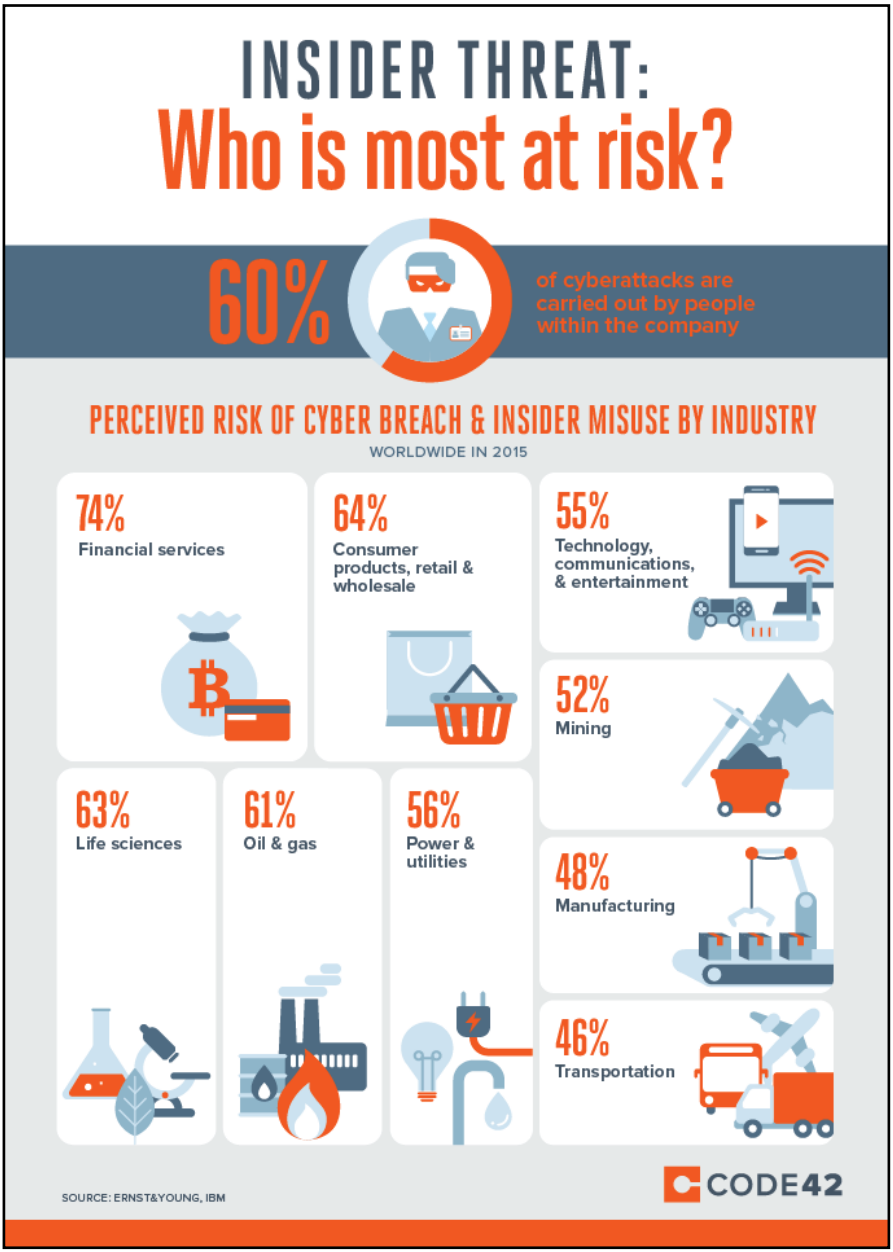
- We are not techno-utopians (read Evgeny Morozov's WSJ article on digital dictatorship), but we are not techno-pessimists either. Perhaps you can consider us as: "techno-realists."
- This paper was written in the same spirit of Jonathan L. Zittrain book's The Future of Internet and how to stop it.

Why wireless network security?

See the following **infographics** on the rapid growth of wireless network, IoT etc and how they impose real and present threats to our basic human right: our data **privacy** etc.


A glimpse at 2017's notable security events
Inadvertent insiders leaked billions of records
Incidents and attacks downshifted in top-targeted industries
79%
22%
16%
76%
424%
Financial services was most targeted
Ransomware impacted millions of victims
NotPetya
Bad Rabbit
WannaCry
For more information
IBM


10
CYBER SECURITY PREDICTIONS
FOR 2018
1
FIERCER ATTACKS ON THE INTERNET THINGS
No significant changes are expected on US law pertaining to this matter
2
IMPROVED BOTS
The increase of hivenets and self-learning swarmbots
3
EVOLUTION OF RANSOMWARE
It has grown dramatically in the last year thanks to the ransomworms and some other types of attacks
4
EMAIL ATTACHMENTS & SUSPICIAL LINKS
The use of fake and/or malicious news through bots is also something expected.
5
AUTOMATED SERVICES
The dark web and cyber-crime economy will offer new services through automation
6
MACHINES BUILDING MACHINES
Among the cyber security firms, there have been hundreds of millions of malware detections registered, there are over 16,000 variants from over 2,000 malware families
7
NORTH KOREA WARFARE
Things are getting tense with North Korea, and as they manifest online, cyber war is most likely in order.
8
9
10
BACK TO


INSIDER THREAT:
Who is most at risk?
60%
of cyberattacks are carried out by people within the company
PERCEIVED RISK OF CYBER BREACH & INSIDER MISUSE BY INDUSTRY
WORLDWIDE IN 2015
74%
Financial services
64%
Consumer products, retail & wholesale
55%
Technology, communications, & entertainment
52%
Mining
63%
Life sciences
61%
Oil & gas
56%
Power & utilities
48%
Manufacturing
46%
Transportation
SOURCE: ERNST&YOUNG, IBM
CODE42

HOW SMART HOMES GET HACKED

Smart TV. Tablet. Printer. Storage. You have the perfect living room set up, but is it setting you up for a cybercriminal attack?

Smart Devices
With no encryption, your smart TV can be used to intercept onscreen payments, access files and discover other vulnerabilities.

Network Attached Storages
Storage devices have weak default passwords. Once attackers get in, they can inject malware and infect other devices.

Internet Router
Hidden functions let your ISP access everything from your laptop to your webcam. What would happen if a cybercriminal took over?

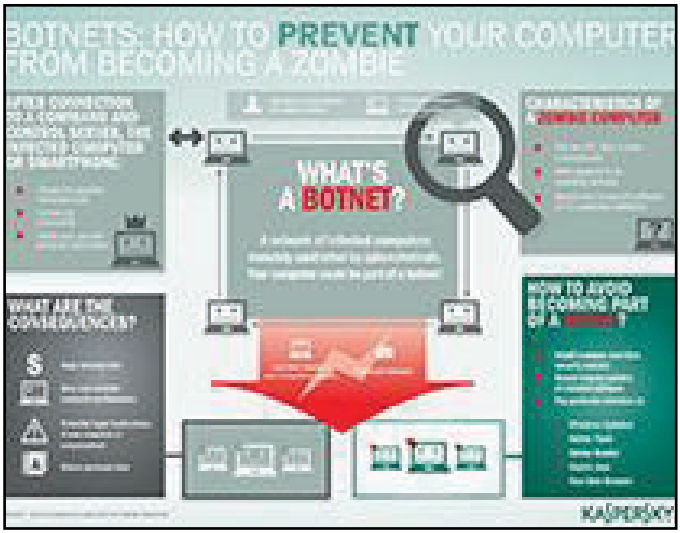
Every Connection Counts
Remember, every connected device can be used as a stepping-stone for an attack.

HOME *SAFE* HOME

Follow these tips to keep your connected devices secure:

1. Get the latest software updates for every device.
2. Change weak default username and passwords.
3. Encrypt files on a private network to restrict access.

https://securelist.com/analysis/publications/66207/iot-how-i-hacked-my-home/


BOTNETS: HOW TO PREVENT YOUR COMPUTER FROM BECOMING A ZOMBIE
WHAT'S A BOTNET?
WHAT ARE THE CONSEQUENCES?
HOW TO AVOID BECOMING PART OF A BOTNET?
KASPERSKY

A question for you

- See closely the following 3 images:
- What are their similarity?

Answer

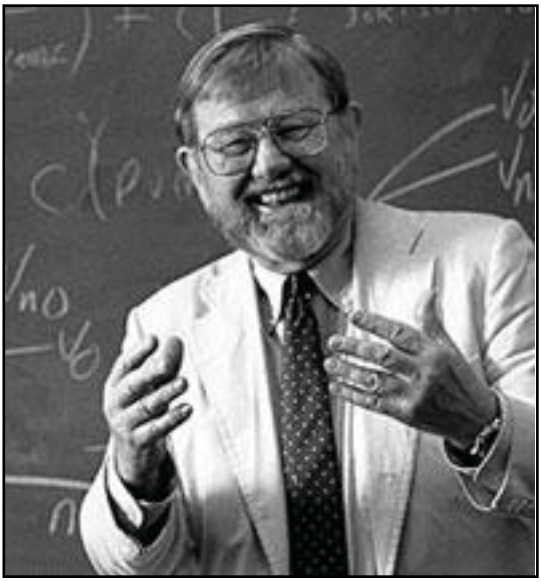
- Collective phenomena, or
- Collective dynamics
- Keyword: cooperation

What is collective action problem?

- Mancur Olson's problem can be formulated in shortest way as follows:
- "how a group can do collective action at large scale, while the benefits are not so tangible for everyone."

Who is Mancur Olson?

Mancur Olson Lloyd, Jr. – (January 22, 1932 – February 19, 1998) was an American economist and social scientist who taught economics at the University of Maryland, College Park. His most influential contributions were in institutional economics, and in the role which private property, taxation, public goods, collective action, and contract rights play in economic development. (https://en.wikipedia.org/wiki/Mancur_Olson)



Can we solve this problem?

Our hypothesis is:

Olson's collective action problem only applies to unconnected society. In a heavily connected society like ours now, actually we can do some meaningful collective actions in the internet at very small

costs, i.e. overcoming Olson's barrier. We call it: superconductive Olson's theorem.

Superconductive Olson's theorem

Mancur Olson's problem: "how a large group can do collective action, while the benefits are not so tangible for everyone."

How to solve it...

Superconductive Olson theorem: "Olson's collective action problem only applies to unconnected society, but not in a digitally connected society."

Outline of argument

- **Case 1:**

  Let us analyze what actually happens when a group of people is trying to do a collective action. Let us say a group of 10 volunteers want to build mini waste treatment plant for their town. Then they need to gather to discuss the design, the required cost, operational cost etc. It becomes easier to accomplish the plan provided they live in the same city, so their transportation costs are minimal. In that case, the voluntary group members do not expect much in return, except to do something good for the town.

- **Case 2:**

  But let us consider a larger group of volunteers in a national scale, this time they want to gather twice a month in a capital city. So, each member of the group needs to spend cost to go to the capital city. Of course they would expect certain benefits in return in order to pay off the costs they have to spend, otherwise the voluntary plan will not become realized.

- **Case 3:**

  In both above cases, Olson's analysis is correct. But Olson wrote his Princeton dissertation around 60s. At the time there was no internet connection except perhaps for military purposes. In our opinion, his theory of collective action is mostly correct, except that he neglects the role of pervasive digital network (internet).

Summary of proposed theorem

To summarize:

Nowadays, a large group of people can work collectively for a cause with almost zero cost. Therefore, actually there is no barrier anymore to gather a large group to do certain collective actions for the community. For example, gathering polls or doing a petition, e.g, www.petition.com.

Concluding remarks

Our own experience over the past few years, which convince us that Olson's collective action problem does not apply in the internet era. It is more like superconductivity phase of material, where electrons can move without resistance.

Concluding remarks (2)

We tend to name our extension of Olson's theorem as "Superconductive Olson theorem." Only time will tell what is its role in the future of Internet.

Are there examples?

- For example: there are some initiatives of online crowdfunding, crowdsourcing, and online cooperatives/microcredits, such as www.startsomegood.com.

- So, actually you can start to do something good to your community even with a small amount of fund, provided you plan properly and do it collectively.

Open problems

- Can we provide online microcredit for most villagers in rural Asia, Africa, Latin America? (just like Grameen bank 2.0)
- How to increase global agriculture productivity using big data and machine learning?
- Can we provide healthcare for all, but with at minimum cost? (this is not the same as providing "healthcare insurance for all" bill)
- Etc.

Thank you for your attention

- Victor Christianto & Florentin Smarandache
- researchgate.net/profile/Victor_Christianto
- Email: victorchristianto@gmail.com,
  smarand@unm.edu
- Presented at 4th Aug, 2018 at 11:30 GMT+5.30

Further reading

- https://www.iottechnews.com/news/2018/may/29/enterprises-preparing-iot-enablement-arevulnerable-older-wireless-network-securitythreats/
- http://www.breachsecurenow.com/2018/03/25/infographic-10-cyber-security-predictions-for-2018-is-your-itot-network-ready/
- https://www.securedgenetworks.com/blog/iotsecurity-4-helpful-tips-to-secure-my-wirelessnetwork

APPENDIX III

Gotong-royongers in action

Term "Gotong-royong" is known in most villages in Java and other islands of Indonesia. This term refers to the collective action by villagers in building up things together. For example: building houses, paving the roads, and so on.

The following pictures depict how gotong-royong in work.

University of New Mexico, United States of America

Neutrosophic Science International Association (NSIA)

has elected

Victor Christianto

as

Head of NSIA branch of INDONESIA

Prof. Dr. Florentin Smarandache,
President

Date *August, 17th 2018*