

GRAND UNIFICATION OF HUMAN KNOWLEDGE

(Version $\alpha 1.00$)

Author: [SURESH K MARAN](#)

Abstract

In this paper we will discuss how various fields of knowledge can be unified, first in physical sciences, then in Life-Dependent Sciences and ultimately try to develop a grand unified understanding of both sciences.

Contents

| | | |
|----------|---|-----------|
| 1 | INTRODUCTION..... | 2 |
| 2 | CLASSIFICATION OF HUMAN KNOWLEDGE | 2 |
| 3 | UNIFIED UNDERSTANDING OF PHYSICAL SCIENCES..... | 5 |
| 4 | UNIFIED UNDERSTANDING OF LIFE-DEPENDENT SCIENCES | 8 |
| 5 | UNIFIED UNDERSTANDING OF SOCIAL AND LIFE-RELATED SCIENCES..... | 10 |
| 5.1 | LARGE SCALE | 10 |
| 5.2 | SMALL SCALE..... | 10 |
| 5.3 | UNIVERSE AND CONSCIOUSNESS | 13 |
| 5.4 | CONCEPTUAL UNIFICATION | 13 |
| 5.5 | ART, MUSIC AND HUMANITIES | 15 |
| 5.6 | FORMAL AND APPLIED KNOWLEDGE | 16 |
| 5.7 | THEORETICAL UNIFICATION..... | 16 |
| 6 | SUMMARY AND CONCLUSION..... | 17 |
| 7 | REFERENCES: | 17 |

Author: SURESH K MARAN
Founder, Director, CEO
UNITESERVE® Group of Companies
www.uniteserve.com
www.sureshmaran.com
<https://www.linkedin.com/in/sureshmaran/>

1 Introduction

A major challenge in dealing with human knowledge is trying to understand how all pieces of them in a given field are related to each other as part of a more general idea in a unified way, and from the more general idea how to deduce all other specific ideas in a given field. Scientists particularly physicists like to arrange physical theories in a systematic fashion from general to specific. Various specific pieces of theories are put together into more general pieces of theories, and further these general pieces are put together into much more general models. Physicists call this process as unification, is a way to get deeper, broader understanding of human knowledge and manage them. Their dream is to find one general theory from which all scientific ideas can be deduced.

While physicists focus on physical theories, there is the other side of human knowledge that deals with human aspects relating to behavior, such as psychology, sociology, etc. There is lots of knowledge gathered in the various fields relating to these but don't have same process of unified approach. Much of the theories in physics has been tested and experimentally verified. When it comes to humanities related fields many fields such as arts are purely subjective. Many of the ideas in behavioral sciences doesn't have much of a systematic scheme for understanding them from general to specific in a rigorous logical way like in physics.

In this paper we will discuss how various fields of knowledge can be unified, first in physical sciences, then in Life-Dependent Sciences and ultimately try to develop a grand unified understanding of both sciences.

2 Classification of human knowledge

There are various ways to classify various fields of human knowledge. The classification of various fields is described in figure below. The more general classification is two: Basic and Applied Knowledge. Basic knowledge helps in understanding. Applied knowledge helps in application of the basic knowledge to satisfy the needs and wants of human beings.

Now the Basic human knowledge can be classified into three types:

- Life-dependent: Everything related to behavioral and mental experience of living matter.
- Material: Everything related to understanding of matter without regard to the mental aspects.
- Formal: The fields such math, geometry, logic and coding which helps in understanding the world.

Under life-dependent comes everything that is of abstract and experiential knowledge that can exist only within the mind of conscious entities like human beings. The some of the various fields under this category are as follows:

- Humanities
- Arts
- Math
- History
- Social Sciences

- Behavioral Sciences

Material related fields are anything that is related to non-living aspects of material. These could be many things:

- Physics
- Chemistry
- Engineering
- Technology
- Biology
- Astronomy

We can further classify many of these fields of education into many different subfields.

Applied human knowledge includes fields such as engineering, applied sciences, professions, and applied math. These are deduced from the basic knowledge.

Applied human knowledge can be deduced from basic human knowledge. The formal knowledge acts as tools to understand and apply the other two basic human knowledge: the material and life dependent knowledge. So, in this paper we will discuss how to unify the latter two basic human knowledge.

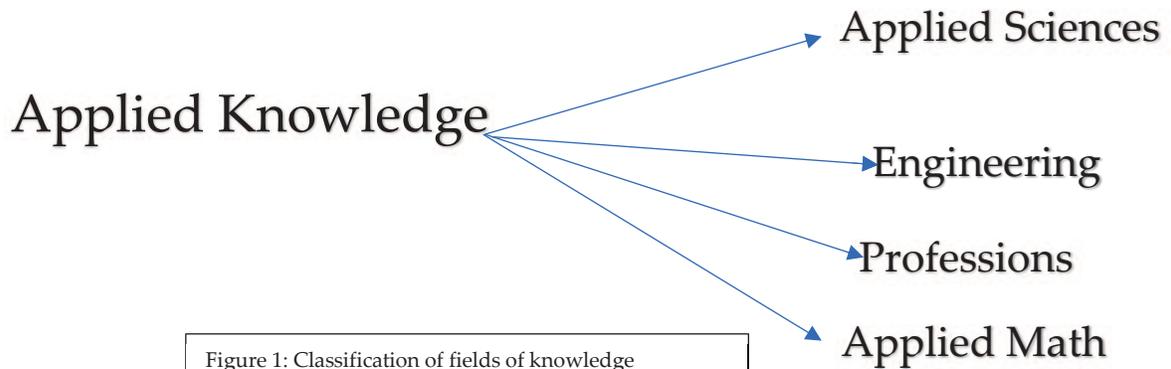
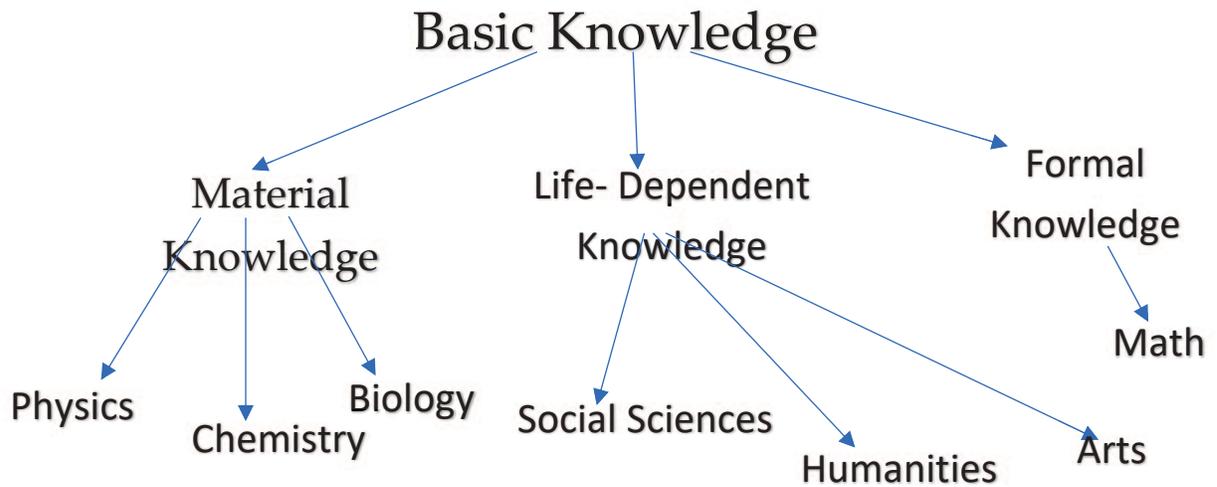
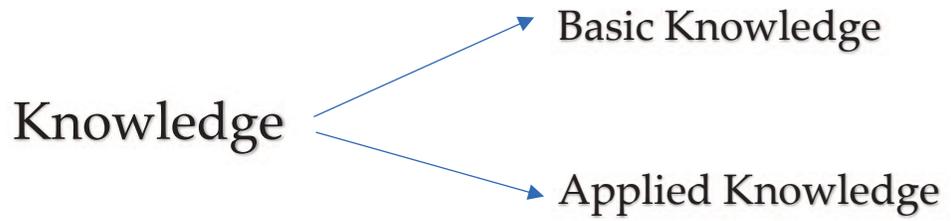


Figure 1: Classification of fields of knowledge

Now the life-dependent and material fields both involve science related fields. For example, social sciences and physics, etc. are part of sciences. Most other fields derived from these are applied fields such as engineering, applied physics, etc. Now in the material and life-dependent fields, the fields that are not studied using science are like humanities, arts, math, etc. While categorizing all the fields depends on simply trying to group them in proper way is largely based on intuition, but unification of all the fields is intense task. This requires deriving one field from another field such as chemistry from physics, in rigorous and systematic fashion. It also involves discovering a new field that unifies many different fields, such as electromagnetism which unites electricity and magnetism.

3 Unified understanding of Physical Sciences

Lots of progress have been made which unites much of subfields of physics such as atomic physics, nuclear physics, electromagnetism, material sciences, special relativity, etc. This is called the standard model of particle physics. Major challenge for unification sort by physicists is uniting the standard model with gravitational physics as described by general theory of relativity.

The standard model of particle physics is written using quantum theory, while general relativity is a classical theory. The standard model of particle physics describes microscopic worlds such as atoms, molecules, nuclei, etc. General relativity describes the universe in cosmological scale. Even though these two theories have many common mathematical and theoretical framework, creating a theory that subsumes these two theories fully remain a future challenge.

There are two types of unification that needs to be done in fundamental physics: 1) Conceptual Unification and 2) Mathematical unification of various theories of fundamental physics. Let's look at these one by one.

Conceptual unification:

Conceptual unification refers to unification of basic concepts in quantum mechanics and General Relativity of Einstein which is a major challenge. We will discuss a conceptual unification framework described in a series of papers by myself [4]. Let me give you a general description here.

Quantum Mechanics describes the world as complex superposition of various states of the universe. This superposition keeps undergoing collapse whenever there is a measurement by an observer. We don't have an established theory of how this collapse can happen, and this is referred to as the quantum measurement problem. But there is a natural promising concept of how this can happen: the quantum diffusion theory. It basically modifies Schrodinger equation by adding a decohering term which has random variable to randomize the quantum state of the universe, and also semiclassical term which keeps the macroscopic superposition. But the randomization of the quantum state creates problem for smoothness and stability of the universe. So, I have added a smoothening term to the quantum diffusion formulation of the Schrodinger equation of the universe in quantum gravity framework [4].

Applying the standard method of quantization of general relativity results in disappearance of time variable, which is called the problem of time. Basically, Einstein's formulation makes the universe to be invariant under change of coordinates used to describe it. This makes necessary the absence of time coordinate in the quantum formulation. The quantum state of the universe for all time gets compressed into one single state. The incremental change has to happen through change of internal variables at each point. In quantum gravity formulation [4] it was suggested that the variable

can be derived using the direction of expectation value of canonical momenta of fields at each point of space. Starting with an initial state we evolve the state using this direction at each point to get the future state. Then the evolution of quantum state of spatial manifold is done under the condition the integral of extrinsic curvature squared is minimal. Many alternative possibilities were given for this integral in the quantum gravity framework 2[ref:4]. In this way the problem of time could be solved.

Overall the Schrodinger equation of universe as described in quantum gravity framework [Ref:4] contains seven parts:

Smoothering Terms + Static Gravity terms + Gravitational Fluctuations + Semiclassical Terms + Yang-Mills Terms + Dirac Terms + Randomizing Terms

The standard quantum Schrodinger equation can be split as gravity term plus matter terms such as Yang-Mills and Dirac fields. The gravity term contributes to increasing of order by clumping random particles into planets and stars. The Yang-Mills fields and Dirac fields do the opposite by creating entropy, with the help of the randomizing term. Classical interaction between the corresponding particles of these fields creates classical entropy. The gravity part can be split into the static gravity part and gravitational fluctuations. The latter contributes to gravitational waves and related quanta and contributes to entropy. All these Hamiltonian terms acts on quantum state built on such building blocks such as Fock space of fermions and bosons, or by other means such as the spin networks as in loop quantum gravity [7].

Now we have about four different phenomena associated to the quantum evolution of the universe.

- Dynamic Matter: Dirac, Yang mills and gravitational fluctuations. These are the main players of space-time manifold. They can be described by means such as Fock space of these fields, associated to each spatial manifold, describing an instance of the universe.
- Classical Reality term: The semi-classicalizing term narrows down the quantum wave packets associated to the various fields at each point and makes them peaked around the certain classical values of fields at each point. By doing so it creates classical reality out of quantum world.
- Smoothering and Static Gravity -> Increases order: Basically, smoothering terms removes randomness of fields around each point. The gravity clumps matter together and removes order.
- Decoherence Term->Increases randomness and contributes increasing of entropy

The universe is described by the combination of these terms. These four terms can be considered to describe conceptual unification of general relativity and quantum mechanics.

Another challenge is the mathematical unification of all forces of the nature. This mathematical unification can be done in many parts. The standard model of particle physics is quite successful. But the Lagrangian of the standard model of physics has many complex parts. There are many fundamental particles, which doesn't have yet have clear unification. Let me discuss the various approaches currently available.

*String theory: This is the most popular approach. String theory is considering particles as one dimensional vibrating string. The various modes of oscillation correspond to various particles

including gravitons. The strings are considered to live in a dimension more than four particularly ten or eleven dimensions. These extra dimensions are considered to be folded into what is called Calabi-Ya manifolds. There are various types of string theory which can be related by various symmetries. There are infinite number of ground states of string theory, each of which has been considered to be related to a reality in a multi-verse of universes. String theory framework is quite independent from the quantum gravity framework [7], and it is interesting to research how the former can be described using later.

*Loop quantum Gravity and Spin foams. These are younger than string theory and they both are closely related. These theories have emerged from a clever yang-mills formulation of the Einstein's equations. Basically, these theories convert smooth space and time into pieces of the 4-dimensional simplexes put together. These simplexes have spins associated to each 2d (triangle) elements of each simplex. These are closely related to the spin-networks conceptualized by Roger Penrose. The loop quantum gravity and spin foams are being constantly developed, the theory is not yet complete, and more work needs to be done. Unlike the string theory spin foams/loop quantum gravity doesn't consider unification as a main element of the theory. But it can be done by applying spin-foam models to Kaluza-Klein theory which unifies the gravity and yang-mills fields. The compactified extra dimensions gives rise to yang-mills fields. This is conceptually different from string theory. In string theory, the strings corresponding to various quantum particles live in a 4d space-time, with each of its points attached with compactified extra dimensions referred to as the Calabi-Ya manifolds. The strings move both in space-time and Calabi-Ya manifolds. But in Kaluza-klein theory the yang-mill fields arise from how the static compactified extra-dimensions is attached to the 4D space-time metric terms.

Now let us discuss the unified understanding of the physical phenomena using the concept of harmonic relationship structures [4]. Let us discuss the role of harmonic relationship structures in physics. Of the various terms discussed in the foundations of physical sciences, we need to discuss how the universe creates the harmonic relationship structures.

Let us first discuss the harmonic nature of the universe. Gravitational force brings out large scale order in the universe. It is responsible for spherical symmetry of celestial bodies such as planets, stars, black holes, etc. It is also responsible for circular symmetry of galaxies. Any cosmic structure that is neither circular not spherical, is eventually forced by gravity to slowly to exhibit these symmetries. The Higgs fields, scalar fields, Yang mills fields and Dirac fields which create the matter fermions and bosons, has internal symmetries such as $U(1)$, $SU(2)$, $SU(3)$. These are local internal symmetries of quantum field fields at each point. Gravity corresponds to $SO(3,1)$ symmetry locally. From point of most unified theories all gravity, Yang mills, Dirac fields unifies in the initial stage of the universe involving symmetry groups that includes all these symmetry groups. All of the symmetries relate closely to respective conserved terms. Using the symmetry properties, the conserved quantities such Momentum, spin, angular momentum, etc. can be derived using Noether theorem.

Universe starts with perfectly internally ordered state. But while it evolves the various fields splits. From the point of view of Kaluza-Klein unification, space-time dimensions expand rapidly, while extra-dimensions remain curved to maintain internal symmetries. The expansion of universe makes it homogenous and isotropic. Gravity contributes to global order in structures that are eventually created, while all other fields maintains only local order such as symmetries of atoms, molecules, crystals, etc. These local and global ordering, and, local and global symmetries imbues the structures

universe a harmonic nature. The various terms in the quantum gravity framework that contributes to order is as follows:

- The Hamiltonian of gravity contributes to global ordering and also to local symmetries.
- The Yang Mills terms contributes to local symmetries and local order
- The smoothening terms contributes to local order
- Dirac fields contributes to local symmetries. Dirac Particles acts as the objects for gravity and Yang-Mills to order them.

Let's now discuss how structures in the universe are created. Universe initially is homogenous and isotropic, and so is universe is purely harmonic in nature. There are no structures in it. It is well known theory that the quantum fluctuations seeded the creation of large-scale structures. From our physical evolution equations discussed before, these are caused by the randomizing terms of the diffusion equations of the evolution equations. The combination of the stochastic and classical reality terms gradually coverts the quantum superposed state of the initial universe into a stochastic semi-classical state. Spatially invariant and isotropic symmetric states of Yang-Mills and Dirac particles becomes spatially localized. Compatible with this gravity also become microscopically randomized. Under the influence of gravity, the particles clump together to form relationship structures. These randomizing natures of quantum stochastic evolution imbues the universe with an entropic nature of quantum origin. Furthermore, interaction between particles creates further randomization, which contributes to classical entropy. Both classical and quantum entropy seeds the formation of locally random relational structures in universe.

Now the combination of harmonic and entropic nature of the universe drives the formation of harmonic relationship structures. In long-term this creates microscopic entities such as atoms, molecules, crystals, stones, organic materials, etc. Yang mills fields glues the various atoms and molecules in these to imbues various symmetric properties. The combination of harmonic and entropic nature also creates macroscopic entities like large scale structure of the universe, galaxies, galaxy clusters, planets, stars, etc. These are largely shaped by ordering nature of gravity only.

4 Unified Understanding of Life-Dependent Sciences

Life-Dependent Sciences have numerous fields: economics, psychology, politics, sociology, etc. These different fields don't have a unified understanding. The theory of mind and relationships [1] published provides a formal structure for unified understanding of all Life-Dependent Sciences fields. Let me discuss how each of the fields can derived from basic ideas formulated in the book.

The first volume introduced the 3R model of mind and it takes into account diversity of emotions, interaction between emotions, diversity of cultural phenomena and skills, various thought pattern associated. This theoretical formulation gives quite good understanding into people behavior, intellectual differences, and productivity.

The second volume of the book set unifies human history, politics, anthropology, genetic genealogy, sociology and economics. The entire book builds on the basic theory built in the first volume. The third volume gives general ideas on how to apply various ideas to various aspects of human life. The three-volume book is quite theoretically structured, and much work needs to be done.

Based on the 3R model we can characterize various fields. Let briefly describe them:

- History: In the second volume we discussed the history of human evolution as relationship phenomena using the 3R model. We discussed migration history, zonal history, intrazonal history and political history. We also discussed the interconnection between these.
- Politics: In the second volume, chapter 2, political disposition is described as effect of combination of internal disposition and external trigger. Also, we discussed how migration creates countries that are dispositionally different. We also discussed political dynamics in the third chapter, and how various issues are sorted out.
- Sociology: In the second volume chapter 2 we discussed how group phenomena as combined effect of individual differences. We have discussed group disposition and formation of culture based on migration and disposition in chapter 2.
- Psychology: Psychology as started by Sigmund Freud largely focusses on the subconscious mind. In my book [1] I consider subconscious as part of the retentive layer of the 3R model of mind. In first volume we discussed soft inheritance and how characters are shaped. We discussed various behaviors based on the 3R model.
- Intelligence: In the first volume, we discussed the interconnection between emotions and intelligence. We discussed various forms of intelligence. In the second volume we discussed how intelligence is shaped by national dispositions.
- Education: The field of education was discussed in the first volume and second volumes. In the first volume chapter 7 we discussed various mentoring methods. Also, in second volume, chapter 7, we discussed academic issues using 3R model. we also discussed how national dispositions influence the educational systems.

Many fields such as art, language, religion, consciousness, etc. will be discussed in section 5. Understanding economics based on 3R model is quite complex and need to be further researched. It requires understanding many things both technological aspects and human aspects. Economic productivity depends on various factors which we discussed all over the bookset[1], such as dynamism factors, dispositional balancing, availability of resources, relationship between states, etc. Building a strong economic model of world or a nation depends on understanding group phenomena based on volume 2 [3]. We discussed various dispositional fluctuations related to the various layers of human mind in chapter 3 of volume 2. All these needs to be put together to understand both macro-economic and micro-economics. So further work needs to be done to create full-fledged theory based on the 3R model in the bookset [1].

We can get of unified understanding of Life-Dependent Sciences using the concept of Harmonic relationship structures. In case of human relationships, the word harmonic means peaceful and stable. Usually this means the various groups of people are co-existing in such a way that their needs and wants are satisfied. This means there is order in the society. The various parts of human societies fit with each other, in a constructive way. In all the three volumes we discussed how dispositional balancing is critical feature of healthy and productive relationships. The societies which are good at creating, maintaining and promoting harmonic relationship structures, become more dominant and influential globally. This what we discussed as the relational formulation of Darwin's theory: **the survival of best related**, in chapter 1 of volume 3 [4]. To summarize, the humanity advances towards

to better and better harmonic relationship state. In the third volume [4], as insider principle we discussed how to create, maintain and promote the harmonic relationship structures.

5 Unified understanding of social and Life-related sciences

Now let's consider the major challenge of uniting physical sciences and life-related sciences to get to grand unified understanding of human knowledge. The grand unified understanding of both these sciences can be done through the concept of harmonic relationship structures introduced in the third volume of my book [4].

5.1 Large Scale

The human history as described in volume 3 [4] can be compared to the evolution of the universe:

- Great human migration out of Africa, is similar to big bang expansion of the universe. There are differences. For example, big bang expansion of the universe is simultaneous expansion of space all over, while human migration is expansion of humans from certain areas in a fixed spatial global geography.
- The settlement of various agricultural societies to form civilizations is similar to formation of local structures in the universe such as galaxies. There were group of societies co-existing similar to galaxy clusters.
- Each person of a society is different because of genetic randomization of genes at birth, and also due to selective expression of genes. This is similar to quantum and classical contribution of entropies of universe. Also, there is randomization of people characters because of interaction between them, either due to soft inheritance [2], due to day to day interaction, and, also due to randomization of genes. As I have described in the bookset [1] the soft-inheritance is quite dominant. The gene randomization somehow has smaller effect on characters.
- In the universe well balanced structures under the influence of external and internal forces, survive over a long-term. In the same way, in the world history well dispositionally balanced societies [3] survive over a long term.
- The combination of harmonic and entropic properties of universe helps in the formation of harmonic relationship structures, such as planets, galaxies, molecules, compounds, etc. Similarly, in human societies these two qualities results in the formation newer and newer organizations such as nations, business organizations, states, etc. The various states in the world have different political and cultural history due to the entropic influence.
- The parts of the physical regions in the universe where a variety of elements meet, we have new types of materials formed. Dynamism centers of humanity, where people of various cultural background meet, are innovative in the formation of new structures, such as ideas, products, and organizations.

5.2 Small Scale

Now the most intimate unification of social and physical sciences requires understanding human consciousness using physics. Emergence of consciousness from physical material is the beginning of Life-Dependent Sciences from physical sciences. The consciousness is the bridge that links material and mental related human knowledge.

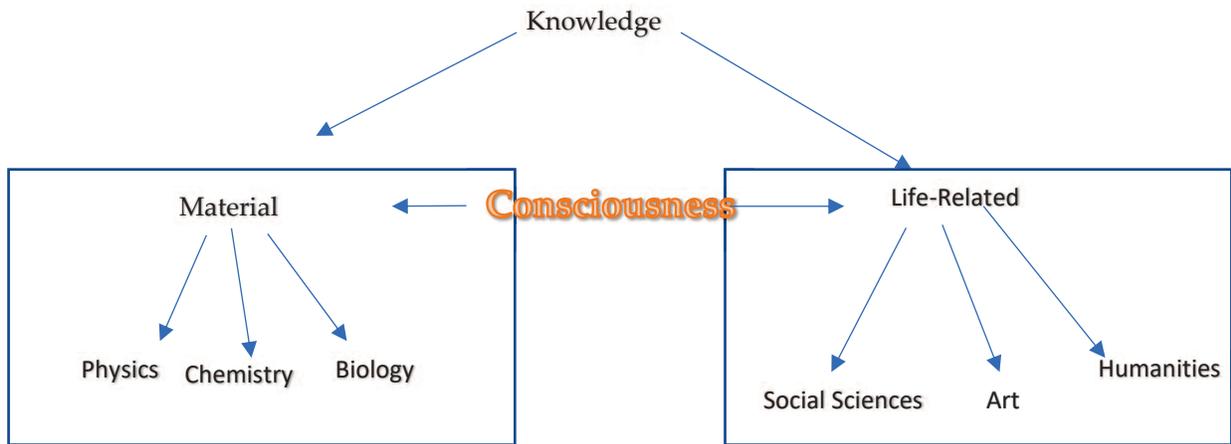


Figure 2: Consciousness as link between mental and material knowledge. It can be considered as the link between physical and Life-Dependent Sciences

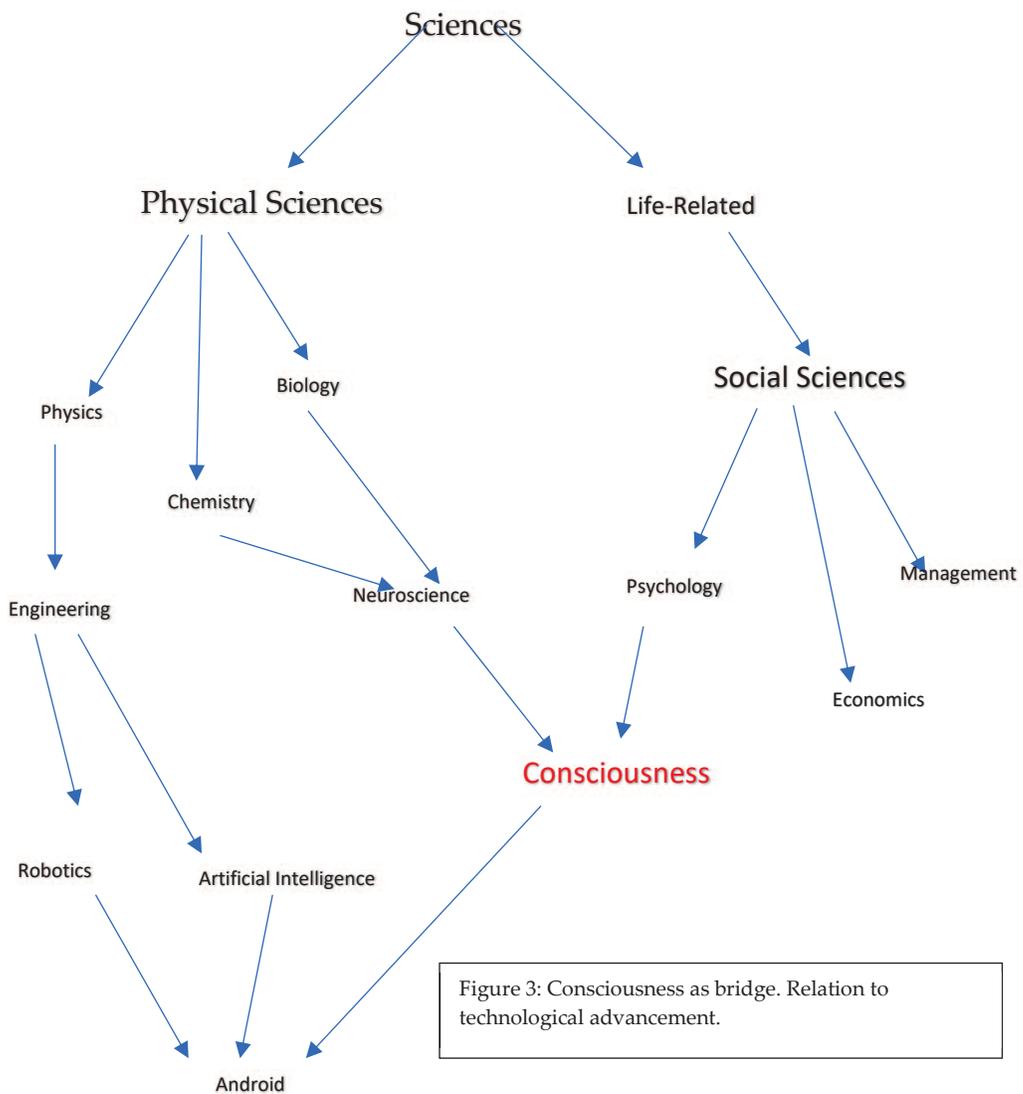


Figure 3: Consciousness as bridge. Relation to technological advancement.

Life-Dependent Sciences can be considered as study of fields based on activities of human being controlled by the activities of the human brain. The physical properties of neurons, their interconnections, can be understood using physics and chemistry. But how the integrated activities of neurons give rise to consciousness, and the subjective experience of the world, is not yet understood and is a further developing field. Out of our conscious activity comes out the fields of humanities and social sciences etc. When consciousness can be derived from physics, it will build a bridge and unify physical sciences and social sciences, further it will unite sciences with humanities, art and math, etc. This will also give an understanding into behavior, and the purpose of human life.

Basically, consciousness arises when the neurons of the brain fire in synchronization to each other. This is a large synchronization of millions of neurons firing throughout the brain mediated by the central neurons such as the thalamic nuclei. If we assume the neurons contribute a microscopic portion of consciousness, the large-scale synchronization brings about integration of consciousness, bringing in full human consciousness. Usually when a person is sleeping or unconscious, we don't have such large-scale firing and synchronization in the regions of human brain. The synchronized firing patterns have various characteristic rates. These are called the alpha, beta, gamma and delta waves etc. Each of these firing patterns generates various elements of the consciousness such as mood, emotions, visual and sensory perceptions¹.

In the third volume [4], I have proposed that the interaction between quantum particles results in measuring of each other states and so conscious perception of each other. The synchronized interaction between various such quantum particles results in unification of consciousness. What exactly is the scientific phenomena? we don't know. I have given mathematical way describe various phenomena described to understand conscious states in the quantum gravity frame 3 [3].

One of the important concepts relating to consciousness is free will. In the book [4], free will is described as continuous quantum decoherence of the macroscopic brain states as it evolves. Now what is the choice the free will makes during decoherence? The brain evolves under the influence of both ordering terms and randomizing terms that we described in section 3. As conscious state is entangled to the rest of environment, it measures the harmonic relationship structures around it. As I have described in the first volume, life seeks harmonic relationship structures. This continuous decoherence of a conscious brain seeks out the best harmonic relationship's structures, and this influences the choices of free will decision it makes. The deterministic terms of the Hamiltonians influence through the accumulated information, so constraints the behavior, such as promoting routine behavior necessary for survival encoded in the memory of the human brain.

The combination of decoherence and the deterministic terms is felt as feelings particularly the sense of degree of aesthetics in music and art. When conscious entities such as human beings are continuously influenced by this, we have various fields of humanities such as art, literature, culture, architecture and all other Life-Dependent Sciences evolve. The free will process of macroscopic decoherence continuously makes the conscious entity to choose history of increasing degree of harmonic relationship structures. We have discussed various ways of measuring the harmonic extent of various structures in quantum gravity framework 3.0 [9].

¹ The ideas were introduced by Koch: Crick, F., Koch, C. (2003). "Framework for consciousness". *Nature Neuroscience*. 6 (2): 119–26. PMID 12555104. doi:10.1038/nn0203-119. The roles of various other waves in consciousness can be obtained by numerous other research papers.

5.3 Universe and Consciousness

Now we discuss the connection of Life-Dependent Sciences to physical sciences. Neurons interact and measure each other, and they synchronize each other leading to full consciousness (chapter 2 of [4]). Similarly, we can apply this framework to the entire universe. Planets, stars, and galaxies are constantly interacting with each other. They also synchronize with each other at various scales: Intra-planetary: rotation planets driving synchronized climatic and geological phenomena, planetary, rotation of planets around stars, stellar: rotation of stars systems around each other, rotation of stars around the galaxy, movement of galactic structures in galactic clusters. Theoretically synchronizations can bring out a unification of conscious components of quantum particles, resulting in certain level of consciousness at various scales. Given this kind of synchronization is quite less compared to synchronization in human brain, nevertheless one need to considers the possibility of existence of it. Now the consciousness at various scales can promote harmonic relationship structures explaining the formation of the beautiful patterns present in the universe, as we seen it in crystals, living things, are arrangement of stars and galaxies.

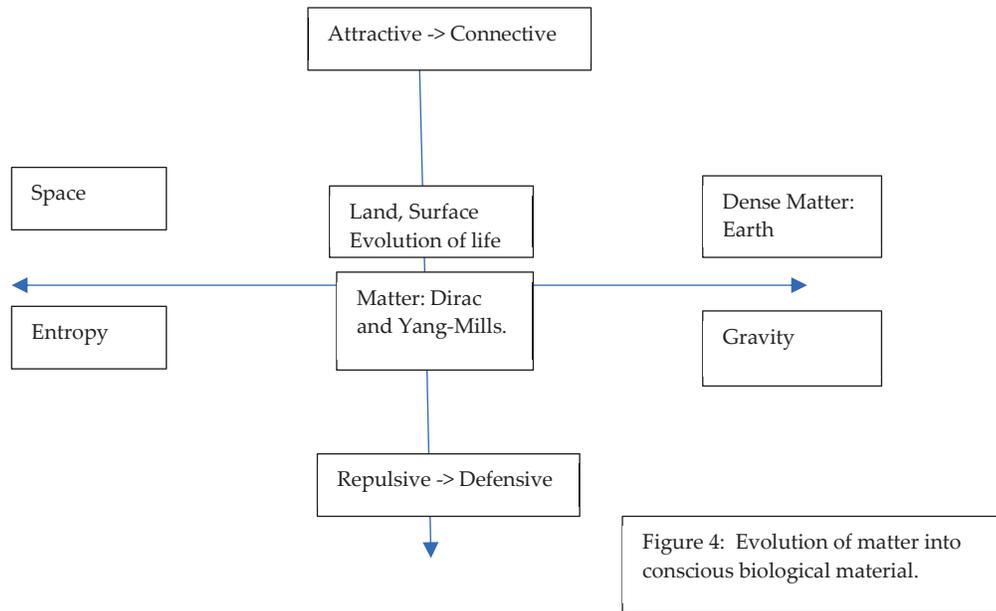
The promotion of harmonic relationship structures is unifying theme for both social and physical sciences. In both, formation, promotion and sustenance of harmonic relationship structures creates essential phenomena: namely social and physical.

Now the consciousness of various scales of universe can interact with each other. The consciousness of higher scales promotes harmonic relationship structures at the same scale and the smaller scales. Simplest example, this is how the planets periodic climatic conditions resulted in life on earth. The conscious entities in the smaller scales can combine together and promote harmonic relationship structures at higher scales.

The influence of higher scale consciousness on lower scale consciousness in promoting harmonic relationship structures, can be given religious interpretation: Influence of higher power on smaller conscious entities. In this way we could bring religious components into the unification scheme.

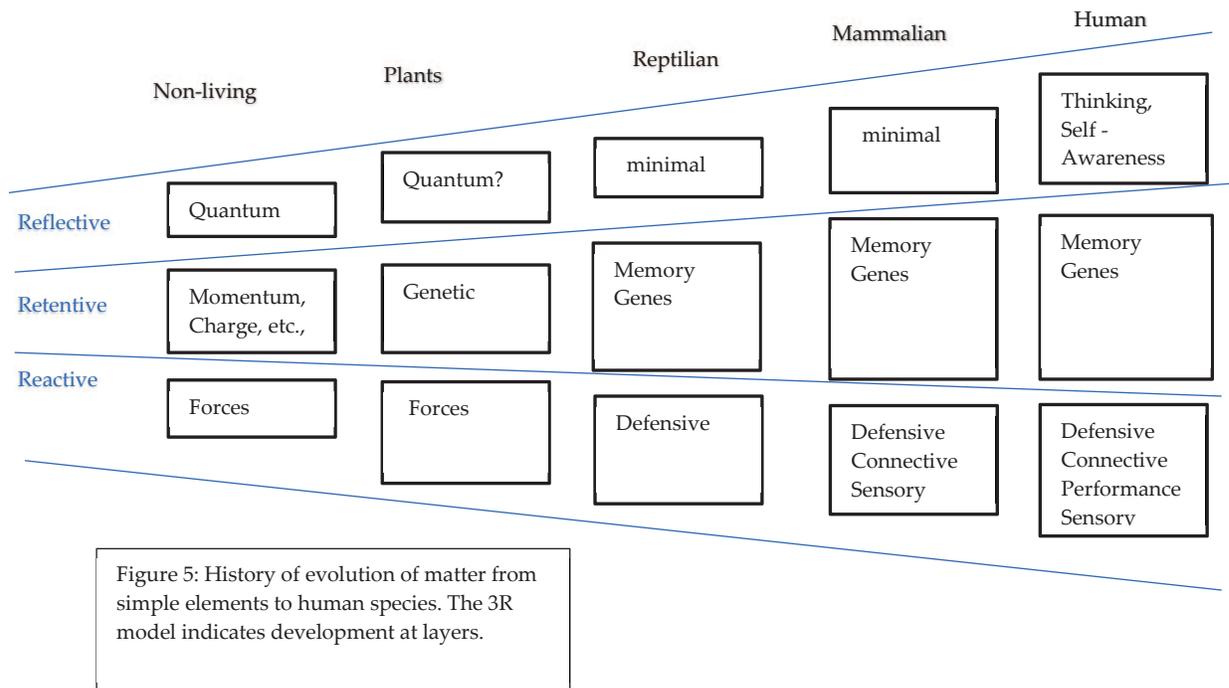
5.4 Conceptual Unification

In chapter 2 of volume 3 [4], we described life as mediator between entropy and order. Evolution of life happens in areas where gravity and entropy meet: It is at the surface of the planet such as earth. At the surface of a planet, such as earth, the land matter meets air and water with optimal temperature. In space there is only entropic matter, with no order. Below the surface we have ordered matter due to influence of gravity. Below the surface, creating structures is difficult as requires more energy. In space creating structures is not possible, as there is not enough matter, and also the structures can be destroyed by radiation, and can be become randomized. At the surface of suitable planet or other regions in the universe we have the possibility of evolution of life, if there is suitable raw material such as carbon, hydrogen, oxygen, nitrogen, etc. In a balanced environment we have formation harmonic relationship structures involving hydrocarbons.



During evolution from inorganic to living things and matter goes through various stages as shown in figure [5]. Non-living matter reacts through various forces, but as it evolves into living matter, it reacts through drives [1], such as emotions, instincts and sensory feelings. Non-living matter makes relationships under the influence of attractive and repulsive forces, largely involving electric fields. When the matter evolves to become living matter, these forces are replaced by connective and defensive drives [2]. Living things interact under the influence of these drives [2].

The complexity of emotions increases during evolution. Reptilians is mostly interacting with defensive behavior. Mammalian also include connective behavior. Humans also have performance behavior which helps in reflective behavior. Overall, the evolution of living matter happens in the increasing relational complexity. They become better in forming harmonic relationships between them. The also become better in creating, maintaining and promoting harmonic relationship structures such as products, tools and architecture.



5.5 Art, Music and Humanities

We discussed how the universe evolves towards creation of harmonic structures involving planets, stars and galaxies, under the influence of harmonic and entropic nature of universe. These is natural art formation in universe involving celestial bodies, or matter on the planets. It is also colorful and aesthetic. Also, various patterns of wind and air on planets and stars produces rhythmic sounds. These things happen naturally.

When living matters evolves there are two harmonic relationship structures created: 1) For survival, and 2) For pure entertainment. The first type harmonic relationship structures are such as people organization, shelter, food consumption and survival related tools. The second type of harmonic relationship structures are such as songs, music, and entertainment. The first type harmonic relationship structures are motivated by drives, such as emotions, instincts and sensory feelings excluding those that motivate the second types of harmonic relationship structures. The second type of harmonic relationship structures are driven by sensory feelings that are related to aesthetics, rhythm, order, beauty, etc.

Now the first type of harmonic relationship structures is created for survival. The question is why would living things want to survive. The answer is to enjoy the second type of harmonic relationship structures; to enjoy music, songs, beauty, rhythm, order, symmetry etc. Consciousness naturally seeks the second type of harmonic relationship structures. The universe evolves to produce harmonic relationship structures such as various celestial bodies and matter. And it evolves living entities to consciously to generate harmonic relationship structures make the universe orderly, beautiful and rhythmic.

Now usually the study of arts, humanities subjects such as literature are motivated by both creation of survival and aesthetic related drives. So usually human produced harmonic relationship structures are combination of both types. For example, a person who looks beautiful is both aesthetic being pleasant to look and also healthy which helps in survival. Stories, movie, and songs have both rhythm, aesthetic qualities, and also is informative about survival. Similarly, the field of Architecture has both survival and aesthetic needs.

5.6 Formal and applied knowledge

The evolution of human mind makes it capable of formal knowledge such as math, logic and coding, as they help in survival. The universe can be described using these is wonderful. The ability of human mind to process these is also wonderful. The understanding of such capabilities of human mind requires understanding consciousness and cognitive processes of human mind. The formal knowledge helps in understanding and unification all other fields.

The evolution of human mind makes it possible to apply basic knowledge to create applied knowledge such as professions, engineering, applied sciences, etc. The application of the basic knowledge is motivated by innate human need to create harmonic relationship structures.

5.7 Theoretical unification

In quantum gravity framework 4.0 [11] I have expressed a covariant framework for quantum gravity. There many components.

1. Relative-Time evolution: This is the evolution of quantum fields on space time with specific foliation of space time and the space of internal fields.
2. Relative Decoherence: It is decoherent evolution of the universe depending on foliation in space and time, and internal fields.
3. Global Reduction: This describes how foliation in space and time and internal fields are determined for global quantum reduction. This also relates to how conscious observers and their foliations for perception of reality around are connected.
4. Smoothing terms: This promotes the smooth property of the universe.
5. Harmonic relationship terms: In the final part of quantum gravity framework 4.0 [12], I included measure of harmonic relationship structure and suggested a way to include it. My proposal is that the complexity of harmonic relationship structures tends to increase over time.
6. Consciousness and Qualia: This is about how harmonic relationship structures in brain relates to consciousness, experience and perception in human brain. This needs full experimental investigation and theory and modelling

The first four describes both entropic and gravity terms as I have discussed before. The fifth and sixth term includes the harmonic structure terms, which relates to consciousness and its pure wants. So, in the universe we have interplay of three major phenomena: Entropy, Gravity and Life. Each of them tends to promote each other. Entropy in space keeps increasing, gravity around the blackholes keeps increasing as it tries to attract matter, and life tries to promote structures in the universe. They can promote each other or destroy each other. The long-term evolution of the universe depends on the interplay of these three.

6 Summary and conclusion

We have described the unification of physical and Life-Dependent Sciences. These two fields describe material and mental aspects. Consciousness seems to be the bridge between the two fields. The Harmonic relationship structures are unifying theme for both. Consciousness acts as mediator between 1) gravity + smoothening, which increase order, and 2) quantum decoherence + gauge particle interactions which increase entropy, to help the creation of harmonic relationship structures. The tendency to form harmonic relationship structures derives the social and physical phenomena, resulting in interesting social and physical structures at various scales.

So much further work needs to be done to develop further understanding of various fields from the basic concepts described in this paper in rigorous and systematic fashion. For example, we may need to understand how different languages or different architectures evolved around the world.

We have philosophical description of various concepts such as how consciousness works. But working out in detail in the physics and mathematics is necessary. Some mathematical ideas were given in my latest paper [9].

The unification of various forces is still out there, with many choices such as string theory, loop quantum gravity or spin/foams. It requires both mathematical and physical experiments, and, possibly development of new mathematical and physical concepts.

7 References:

1. Suresh K Maran, Emotions, The New Structured Foundations of Social Sciences, 3 volume book set. Please refer to the next 3 items below. Please visit the site www.scientificrelationism.com/shop for information. First published in Amazon KDP, October-25-2021.
2. Suresh K Maran, The New Structured Foundations of Social Sciences: Volume I: Human Mind and Relationships. Please visit the site www.scientificrelationism.com/shop for information. First published in Amazon KDP, October-25-2021.
3. Suresh K Maran, The New Structured Foundations of Social Sciences: Volume II: Human Relational-Economic Evolution. Please visit the site www.scientificrelationism.com/shop for information. First published in Amazon KDP, October-25-2021.
4. Suresh K Maran, The New Structured Foundations of Social Sciences: Volume III: Scientific Relationism and the Future of Humanity. Please visit the site www.scientificrelationism.com/shop for information. First published in Amazon KDP, October-25-2021.
5. A Framework of principles for quantum gravity. Please visit the site www.qstaf.com for information and references.
6. Suresh K Maran, Quantum Gravity Framework: 2.0. A Complete Framework of Principles for Quantum General Relativity with Time and Measurement, <http://www.qstaf.com/OGframework2.0> . First published in arxiv: <http://arxiv.org/abs/1303.6539v3>, dated 30 Mar 2016. Research gate direct link: [Click here](#).
7. Loop quantum gravity: A good place for quick introduction and references is https://en.wikipedia.org/wiki/Loop_quantum_gravity.

8. String theory: A good place for quick introduction and references is https://en.wikipedia.org/wiki/String_theory.
9. Suresh K Maran, Quantum Gravity Framework: 3.0. A Complete Framework of Principles for Quantum General Relativity with Time and Measurement, <http://www.qstaf.com/QGframework3.0> . First Published in Research gate: Direct link: [Click here](#). Doi address: <http://dx.doi.org/10.13140/RG.2.2.28466.32960>. Dated June 24, 2021.
10. Edward Anderson, Problem of Time in Quantum Gravity, Annalen der Physik, Vol 524 pp 757-786 (2012), arXiv:1206.2403.
11. Suresh K Maran, Quantum Gravity Framework: e.0. A Complete Framework of Principles for Quantum General Relativity with Time and Measurement, <http://www.qstaf.com/QGframework4.0> . Quantum Gravity Framework 4: Covariant framework, Structure Formation and Consciousness in the Universe. First Published in Research Gate: Direct Link: [Click here](#). Doi address: <http://dx.doi.org/10.13140/RG.2.2.15044.55688/1>. Dated June 24, 2021.