

On the Philosophical Ontology for a General System Theory

CUI Weicheng

Key Laboratory of Coastal Environment and Resources of Zhejiang Province (KLaCER)

School of Engineering, Westlake University, Hangzhou, China

System is a very general concept and theoretically speaking, every problem encountered can be modeled as a system. Thus, the general system theory (GST) proposed by Bertalanffy (1968) and developed by many others e.g. Bunge (1977; 1979; 1983a; 1983b) and Maturana and Varela (1980; 1987) could be treated as a theory of everything (TOE). However, it is well-known that the present version of GST has not reached the level of TOE because it lacks a clear ontology. Currently, quantum mechanics (QM), Newtonian mechanics (NM) and general relativity (GR), suitable for microscopic, macroscopic and cosmic phenomena respectively are based on very different ontologies. In this paper, a unified ontology for the general system theory which could be applied to any scale from micro to cosmic is proposed. It is expected that this could lay a foundation to generalize GST to TOE.

Keywords: system, general system theory, philosophy, metaphysics, ontology, matter, mind, aether

Introduction

Whether a unified theory of everything (TOE) is possible or not is fundamentally a philosophical question and the answer to this question is basically a selection problem which reflects the worldview of the scientists. Presently, most philosophers and scientists select no such as Nancy Cartwright (2000) and John Dupré (1993), but there are still scientists to select yes such as Mario Bunge (1977; 1979; 1983a; 1983b) and Maturana and Varela (1980; 1987). In a previous paper, the present author has argued that to select yes is much better than to select no (Cui, 2021). My basic idea is to generalize the general system theory (GST) proposed by Bertalanffy (1968; 1972) and developed by many others such as Bunge (1977; 1979; 1983a; 1983b) and Maturana and Varela (1980; 1987) into TOE since system is a very general concept and every problem encountered can be modeled as a system.

However, it is well-known that the present version of GST has not reached the level of TOE because it lacks a clear ontology. Currently, quantum mechanics (QM) (Bohr, 1934; Oriols & Mompart, 2019), Newtonian mechanics (NM) (Newton, 1846) and general relativity (GR) (Einstein, 1916), suitable for microscopic, macroscopic and cosmic phenomena respectively are based on very different ontologies. So an urgent task is the unification of these three ontologies. Although both Bunge (1977; 1979; 1983a; 1983b) and Maturana and Varela (1980; 1987) have proposed their own ontologies, the present author does not fully agree with them. For example, I agree with Bunge's first assumption that "the universe exists independently of the knowing subject or observer" but disagree with his second assumption that "a subject may get to know the universe objectively, or in a third-person manner, though only gradually" (Bunge, 2012, p. 1603). Instead, my

assumption about the epistemological postulate is that a subject can only know the world we can observe gradually but not the whole universe and this knowledge can be both objective and subjective in nature. Furthermore, Bunge believed that “observers may design or execute experiments, but their minds cannot act directly upon anything, because there is no such thing as telekinesis” (Bunge, 2012, p. 1604). However, I take a different attitude. I think there is no evidence for this statement while many experimental evidences indicated the existence of telekinesis or more generally psychokinesis (PK) (Radin, 2009; Cardeña, 2018). So I introduced a psychic field to explain the psychic force phenomena.

The purpose of this paper is to propose a unified ontology for the general system theory in order to lay a foundation to generalize GST into TOE.

Obviously, the problems discussed in this paper are very big and they are controversial in nature, but through continuous efforts of some scientists, our understanding to the essences of nature and science, human beings could be much improved and finally a unified TOE may be established similar as other scientific theories we have established.

Current Problems for the Ontology of Different Systems

The Concept of System and Its Corresponding General System Theory

According to Bertalanffy (1968), a system is a group of interacting or interrelated entities that form a unified whole. A system is delineated by its spatial and temporal boundaries, surrounded and influenced by its environment, described by its structure and purpose, and expressed in its functioning. This definition is obviously relied on the definitions of time and space.

The notion of system is as old as European philosophy (Bertalanffy, 1972) or even earlier in oriental philosophy (Capra, 1975). Being a practicing biologist, Bertalanffy (1972) found that physicalistic theories, modeled according to the Newtonian paradigm were unsatisfactory. He was particularly interested in developing a theory of open systems, that is, systems exchanging matter with environment as every living system does. Such a theory did not then exist in physical chemistry. Maturana and Varela (1980; 1987) found the similar problems and they developed the concept of autopoiesis in order to explain the essential characteristics of living as opposed to nonliving systems. In their concepts, a living system such as a cell has an autopoietic organization, that is, it is “self-producing”. Autopoietic systems can produce themselves and only themselves while autopoietic systems (e.g., a car) produce something other than themselves. However, why the living system has these characteristics has not been explained. The theory of open systems stands in manifold relationships with chemical kinetics in its biological, theoretical, and technological aspects, and with the thermodynamics of irreversible processes, and provides explanations for many special problems in biochemistry, physiology, general biology, and related areas (Bertalanffy, 1972). However, in Bertalanffy’s concept of open system, what physical quantities could be exchanged between an open system and its environment at the system boundary has not been clearly specified. This is closely related to the ontology and currently, there are three possible quantities: matter, energy and information. However, what are the relations among the three quantities are unclear to most of the people. The purpose of this paper is to discuss different models for these relationships.

A GST can include system science, system technology and system philosophy (Bertalanffy, 1968). Obviously, the focus of this paper is system philosophy rather than system science and system technology.

Basic Concepts Related to Philosophy, Metaphysics and Ontology

Philosophy is the study of general and fundamental questions, such as those about reason, existence, knowledge, values, mind, and language (McGinn, 1993). Philosophical methods include questioning, critical discussion, rational argument, and systematic presentation. Today, major subfields of academic philosophy include metaphysics, epistemology, ethics, logic and aesthetics (Appiah, 2003). Other notable subfields include philosophy of science, philosophy of engineering, philosophy of arts, political philosophy, philosophy of language and philosophy of mind.

Metaphysics is the study of the most general features of reality, such as existence, time, objects and their properties, wholes and their parts, events, processes and causation and the relationship between mind and body (Chalmers, Manley, & Wasserman, 2009). Metaphysics is considered one of the four main branches of philosophy, along with epistemology, logic, and ethics. Metaphysics includes cosmology, the study of the world in its entirety and ontology, the study of being. Metaphysics seeks to answer, in an abstract and fully general manner, the questions: (1) *What is there?* and (2) *What is it like?* (Harris, 1965).

Currently, there are two broad stances about what is the world studied by metaphysics (Crane & Farkas, 2004; Koons & Pickavance, 2015). According to metaphysical realism, the objects studied by metaphysics exist independently of any observer so that the subject is the most fundamental of all sciences. Metaphysical anti-realism, on the other hand, assumes that the objects studied by metaphysics exist inside the mind of an observer, so the subject becomes a form of introspection and conceptual analysis. This position is of more recent origin. Some philosophers, notably Kant (2002), discussed both of these worlds and what can be inferred about each one. Some, such as the logical positivists, and many scientists, reject the metaphysical realism as meaningless and unverifiable. Others reply that this criticism also applies to any type of knowledge, including hard science, which claims to describe anything other than the contents of human perception, and thus that the world of perception is the objective world in some sense. Metaphysics itself usually assumes that some stance has been taken on these questions and that it may proceed independently of the choice—the question of which stance to take belongs instead to another branch of philosophy, epistemology.

This paper is focused on ontology. Ontology is the branch of philosophy that studies concepts, such as existence, being, becoming, and reality and it is a subfield of metaphysics (Crane & Farkas, 2004). It includes the questions of how entities are grouped into basic categories and which of these entities exist on the most fundamental level. Ontology is sometimes referred as the *science of being*. It has been characterized as *general metaphysics* in contrast to *special metaphysics*, which is concerned with more particular aspects of being. Ontologists often try to determine what the *categories* or *highest kinds* are and how they form a *system of categories* that provides an encompassing classification of all entities. Commonly proposed categories include substances, properties, relations, states of affairs and events. These categories are characterized by fundamental ontological concepts, like *particularity* and *universality*, *abstractness* and *concreteness* or *possibility* and *necessity*. Of special interest is the concept of *ontological dependence*, which determines whether the entities of a category exist on the *most fundamental level*. Disagreements within ontology are often about whether entities belonging to a certain category exist and, if so, how they are related to other entities.

A major point of debate in ontology is between realism, which holds that there are entities that exist independently of their mental perception and idealism, which holds that reality is mentally constructed or otherwise immaterial. Metaphysics deals with the topic of identity. Essence is the set of attributes that make an

object what it fundamentally is and without which it loses its identity while accident is a property that the object has, without which the object can still retain its identity. Particulars are objects that are said to exist in space and time, as opposed to abstract objects, such as numbers, and universals, which are properties held by multiple particulars, such as redness or a gender. The type of existence, if any, of universals and abstract objects is an issue of debate.

Current Problems for the Ontology of Different Systems

The present paper mainly focuses on the ontology issues related to the general system theory. We must find out what is meant by “system”, and how systems are realized at the various levels of the world of observation. As opposed to reductionism and theories declaring that reality is “nothing but” a heap of physical particles, genes, reflexes, drives, or whatever the case may be, we see science as one of the “perspectives” that man, with his biological, cultural, and linguistic endowment and bondage, has created to deal with the universe into which he is “thrown”, or rather to which he is adapted owing to evolution and history. If reality is a hierarchy of organized wholes, the image of man will be different from what it is in a world of physical particles governed by chance events as the ultimate and only “true” reality (Bertalanffy, 1972).

The realm of systems philosophy is also the re-orientation of thought and world view following the introduction of system as a new scientific paradigm in contrast to the analytic, mechanistic, linear-causal paradigm of classical science. Like very scientific theory of broader scope, general systems theory has its meta-scientific or philosophical aspects. The concept of system constitutes a new paradigm, in Thomas Kuhn’s (1962) phrase, or a new philosophy of nature, in Bertalanffy’s (1972) words, “contrasting the blind laws of nature of the mechanistic world view and the world process as a Shakespearean tale told by an idiot, with an organismic outlook of the world as a great organization” (Bertalanffy, 1972, p. 421). However, what is the significant difference between mechanism and organism has not been clearly explained in Bertalanffy’s GST. I propose a new model for mind-body relationship to overcome this problem. This will be discussed in Section 3.

In classical physics and general chemistry, matter is any substance that has mass and takes up space by having volume (Penrose, 1991). All everyday objects that can be touched are ultimately composed of atoms, which are made up of interacting subatomic particles, and in everyday as well as scientific usage, matter generally includes atoms and anything made up of them, and any particles (or combination of particles) that act as if they have both mass and volume. At that time, energy is a property of matter similar as mass or momentum and it could have several types of energy, such as potential energy, kinetic energy, electromagnetic energy, thermal energy. In this Newtonian universe model (Newton, 1846), matter is the only existence in the universe. Where do the various forces come from and who create the first matter cannot be answered. Information is totally not considered then.

However, after Plank proposed the concept of quanta, energy becomes an independent existence in parallel with classical matter. Einstein accepted Plank’s concept of quanta and made further assumption that photons are massless particles which is the form of energy existence. I fully agree with Bunge that the expression of “annihilation of matter” and “materialization of energy”, for pair destruction and formation respectively, are incorrect (Bunge, 2000). From my point of view, nothing gets annihilated when a pair of electrons of opposite charge gets transformed into observable but unmeasurable mass quanta like photons and other unobservable quanta. Thus, the meanings of many classical concepts have changed, such as matter, mass, energy, field. Some new hardly-to-be understood concepts were created, such as wave-particle duality, measurement, wave collapse,

mass-energy equivalence. Whether mass should be changed with velocity or photons should have mass are open questions. Many physicists (Adler, 1987; Okun, 1989a; 1989b) argued that mass should not depend on the velocity and some scientists (Tu, Luo, & Gillies, 2005) still believe that photons have masses. As a matter of fact, what is the nature of light, whether light were made of particles, referred to as corpuscles by Newton or light was made of waves as speculated by Christian Huygens has been debated for more than 300 years. Up to now, this debate has not been fully resolved (Oriols & Mompert, 2019). By changing the fundamental concepts of time, space, matter, energy, field, different theories, such as special and general relativity (Einstein, 1916), orthodox quantum mechanics (Bohr, 1934) and Bohmian mechanics (Oriols & Mompert, 2019) have been developed. From the present author's point of view, the great obstacle of the fuzzy definitions of some fundamental concepts in modern physics and other sciences must be removed in order for the progress of unification. To point out this problem is also one of the purposes of this paper.

Based on the general relativity theory (Einstein, 1916), a new universe model called Big-Bang Cosmological Model (BBCM) becomes the dominant theory (Uzan, 2015). This model has been confronted to a variety of observations that make people repair the model continuously and even the latest version is still subjected to many questions. Burago (2017) pointed out that at least two obvious questions exist in the Big-Bang model. The first question remained as to how the matter and energy were in this super dense elementary particle. The second question arose from the insolvency of ideas about the explosion of a kind of "cosmic egg", which was the explosion of the largest nuclear bomb. This point of view boils down to the assertion that "space" exploded, and not a material object. At the same time, the authors of this idea do not bother explaining what they think is a "space" and what can explode in an empty space? Therefore, many people are still working on the improvement of the Big-Bang model or the construction of other totally new cosmological models (Joyce, Jain, Khoury, & Trodden, 2015; Cui, 2019a; 2019b; 2019c).

All the modern sciences including the BBCM are based on the materialism which holds that matter is the fundamental substance in nature, and that all things, including mental aspects and consciousness, are by-products or epiphenomena of material processes without which they cannot exist. According to this doctrine, the material creates and determines consciousness, not vice versa. Now this philosophy cannot explain many life phenomena, such as near-death experiences, mediumship, children claiming to remember episodes from a past life (Moreira-Almeida & Santos, 2012). Sheldrake (2012) discussed in quite detail about the 10 dogmas of modern science based on materialism and some people even claimed that it is the time now to end the materialism (Tart, 2009). The most difficult question for the materialism believers is how the first matter comes from and what is the source of forces which cause every object to move in the universe. So, some people are exploring "Beyond a Materialist Worldview—Towards an Expanded Science" (Walach, 2019).

In the late 19th century with the discovery of the electron, and in the early 20th century, with the discovery of the atomic nucleus, and the birth of particle physics, matter was seen as made up of electrons, protons and neutrons interacting to form atoms. In order to explain the electromagnetic phenomena observed, an electromagnetic field concept is introduced by Maxwell (1865) who realized the unification of electric force and magnetic force. Later this concept of field has extended to gravitational field and for other forces. Today, we know that even protons and neutrons are not indivisible and they can be divided into quarks, while electrons are part of a particle family called leptons. Both quarks and leptons are elementary particles, and are currently seen as being the fundamental constituents of matter (Allday, 2001). These quarks and leptons interact through four fundamental forces: gravity, electromagnetism, weak interactions, and strong interactions. The early

purpose of the concept of field is to explain the action at a distance. For example, let us consider an isolated system of two bodies whose masses are M and m , according to Newton's gravitational law, there exists an attraction force F between these two objects and $F=GMm/r^2$, where r is the distance between the centers of their masses, and G is the gravitational constant. In that case, if we choose M as the fixed coordinate system and study the relative motion of m , then we can say that there exists a gravitational field around the body of M and another body m will be acted if it is located in the field. If more than two objects, then the field of each object can be superposed except the object to be studied. Thus, field is caused by all the objects in the universe rather than it is a new object. However, it is gradually materialized when the concept of energy is treated as an independent existence, such as the Einstein (1916) field equations.

In physics, energy is the quantitative property that must be transferred to an object in order to perform work on, or to heat the object. Energy is a conserved quantity; the law of conservation of energy states that energy can be converted in form, but not created or destroyed. The SI unit of energy is the joule, which is the energy transferred to an object by the work of moving it a distance of 1 metre against a force of 1 Newton. Energy means something transfers from one object to another. Is energy a property of matter or non-matter, or another independent existence? Presently, there is no consensus.

Common forms of energy include the kinetic energy of a moving object, the potential energy stored by an object's position in a force field (gravitational, electric or magnetic), the elastic energy stored by stretching solid objects, the chemical energy released when a fuel burns, the radiant energy carried by light, and the thermal energy due to an object's temperature. Before the occurrence of the concept of quantum, energy is a property of matter. However, after Plank proposed the concept of quanta as purely particles of energy called energy packets, energy becomes an independent existence similar as matter and then the concept of field is also changed. I recommend that these traditional concepts should be reserved.

Having discussed the problems related to the concepts of matter, energy and field, now we need to examine the concept of information.

Up to now there is no commonly agreed definition for information. For some people, information is thought of as the resolution of uncertainty (Shannon, 1948) and for others; the concept of information has different meanings in different contexts (Floridi, 2010). Thus, the concept becomes related to notions of constraint, communication, control, data, form, education, knowledge, meaning, understanding, mental stimuli, pattern, perception, representation, and entropy. However, no clear answer is given to the question how information is generated and who generates it. So, its essence and the nature are not detected. The influence of information on the behaviour of human beings participated in a complex system has not been received adequate attention.

Information is certainly related to life and especially without human beings, information or even everything is meaningless. In order to answer the challenging question "What is life?" (Schrödinger, 1944), the scientist and philosopher Draganescu (1979) stipulated that information is actually a fundamental component of the universe, from the primary stages to nowadays forms, which allows the structuration of matter (inert matter + information \geq structured matter) and of the living systems (structured matter + information \geq living structures) (Draganescu, 1990). Such a philosophic stipulation was accepted by Gaiseanu (2020a; 2020b) and he developed an informational model of the living creatures and he claimed that "this informational model constitutes a general, realist, and coherent model of the mind-body relation, able to integrate and/or explain most of the others" (Gaiseanu, 2021, p. 42). By assuming the powerfulness of information, other challenging

problems seem to be explained similar as by assuming the speed of light is a constant and independent of coordinate systems, Einstein is able to explain many observed phenomena. Such a type of logic is actually self-circulation. Both Draganescu and Gaiseanu avoided the challenging questions mentioned before, how information is generated and who generates it?

Suggestion of a New Ontology for the General System Theory

On how to present a scientific theory, Maudlin thinks that a canonical presentation of a physical theory shall specify six aspects: (1) the fundamental physical ontology; (2) the spatio-temporal structure; (3) the mathematical items; (4) the nomology; (5) mathematical fictions; and (6) derivative ontology (Maudlin, 2018). I fully agree with his opinions. In developing a scientific theory, a clear picture of the fundamental physical ontology is very important and it can be examined and tested by others.

As mentioned earlier that ontology is characterized as a *general metaphysics* that studies concepts, such as existence, being, becoming, and reality. It includes the questions of how entities are grouped into basic categories and which of these entities exist on the most fundamental level. Ontology is sometimes referred as the *science of being*. The present problem existed in modern sciences is that different ontologies are used to explain microscopic and macroscopic and cosmic phenomena. So, the purpose of this section is to specify an ontology which can cover from microscopic to macroscopic and cosmic phenomena.

The first question related to ontology is what it is *like for the Universe*. From the definition of the system concept, we can find the phenomenon that in order to define a concept, we need to rely on other concepts. We do not accept such a definition that A is A, but we accept the definition that A is B with some characteristics. In describing the characteristics, some other concepts have to be referred to. So, we can conclude from this observation that if we want to describe something, we at least need to use a pair of concepts A and non-A (two-valued logic), or sometimes more concepts, such as A, anti-A, un-A (three-valued logic called Neutrosophic Logic by Smarandache and Christianto (2009)). For the purpose of simplicity, let us use two-valued logic in this paper. For example, in order to have the concept of existence which is defined as something we can observe, touch, feel, or even imagine, then nonexistence should be defined and it can be called either emptiness, vacuum, or nothingness, etc. Before Einstein, people often thought that nature is independent of human beings. As a matter of fact, nothing is independent of human beings, even dependence and independence are defined by human beings. Every concept is defined by human beings, and its properties are measured and interpreted by human beings. Therefore, knowledge is subjective if we regard nature to be objective. From this observation, we can induce the following axiom (Cui, 2021):

TOE-A1: The relativity of simultaneity axiom: There is no such thing as a perspective-independent existence. Every described existence is a relative existence since the concept of existence depends on other concepts, at least its opposite or complement.

Based on this axiom, we need to define several basic pairs of concepts in order to answer what it is like for the universe. In order to describe the change and movement, we need to define time and space and they can form a frame of reference. A quote of Kant can describe their accurate definitions.

Definition 1. "Space and time are the framework within which the mind is constrained to construct its experience of reality" (Kant, 2002).

Basically, there are two types of existences, one is the real existence no matter it is matter or non-matter and the other is the existence created by human beings for the description of the real existences. Time, space,

mass, rest, temperature, entropy, information all belong to the second category of existences. For our human beings, we can only measure or make observation in four-dimensional spacetime; thus any theory which relies on the introduction of spacetime higher than four-dimensional is untestable and violates the fundamental requirement of science (Cui, 2021). In order to answer how large is the universe, there are basically two choices, finite and infinite. It is obvious by selecting infinite we can avoid the further questions such as how large it is and what is the center of the universe since the universe is out of the observation scope of our human beings. As is well-known now, infinitely large (∞) and infinitely small (ε) have been created in mathematics by our human beings. Thus, let us introduce our second axiom (Cui, 2021):

TOE-A2: The infinite universe and finite world axiom: The universe is defined as the largest system our human beings can imagine and it is of infinite nature both in time and space. The world is defined as the largest spacetime our human beings can observe and it is of finite nature both in time and space.

The relation between universe and world can be illustrated in Figure 1. In the past, we have used universe and world to describe the spacetime of a system interchangeably, and we did not make specific distinction between these two concepts. From the definition of a system, we need to have two spacetimes for a system; one is the spacetime for the system itself (the world) and the other is the spacetime for the outside environment of the system (the universe). Through making this distinction, we can know the limitation of science clearly. Science can only study the system within the world we can observe rather than the whole universe and according to Axiom 1, in order to explain the origin of the world we must assume the pre-existence of the universe. This assumption is basically the same as Bunge's assumption of realism "the universe exists independently of the knowing subject or observer (ontological realism)" (Bunge, 2012, p. 1603).

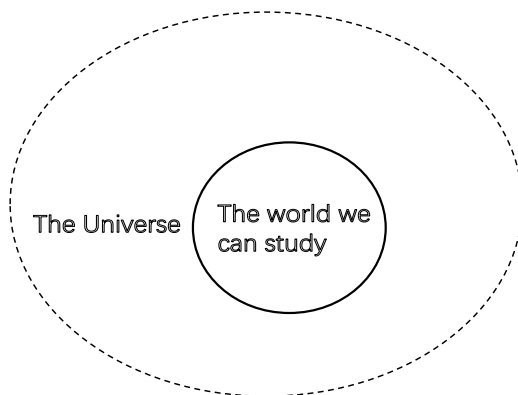


Figure 1. A schematic representation of the concepts of universe and world.

What we have observed in the world we are living are cosmic stars (through eyes plus telescopes), macro objects of living creatures and lifeless objects on earth (through eyes only), and micro particles, such as molecules, atoms, protons, neutrons, electrons (through eyes plus microscopes). If we define matter to be an object of finite mass and finite volume in the space, according to TOE-A1, the existence of matter implies the co-existence of non-matter which does not have mass and occupy space. Let us introduce the following definition:

Definition 2. Any object or particle of mass is called matter, while the thing which enables a body of matter to possess the ability of active movement is called mind.

Then a body with mind is called a living creature while a body without mind is called a lifeless object. A

life can generate active force to make it move while a lifeless object can only move under the forces acted by other objects. I also suggest to attribute all the consciousness phenomena and the information generation ability to the function of mind-body interaction. I do not suggest to study the properties of mind now since it is non-matter and impossible to be observed but we can study the properties of living bodies which are the interactions of mind with body.

From this definition, mass is the fundamental property of matter while the active force is the fundamental property of mind-body interaction. Of course, passive forces due to mass and charge also exist as the famous four types of forces: gravitational, electromagnetic, strong, and weak. It is our speculation that the fifth force called psychic force exists due to the interaction of mind with body. In the same way to explain the four passive types of forces related to matter (gravity, electromagnetism, weak interactions, and strong interactions) by the concept of field, we assume another field called psychic field also exists, we can use this field to explain many parapsychological phenomena (Moreira-Almeida & Santos, 2012; Cardeña, 2018).

All the quantities of mass, velocity, momentum, energy are properties of matter. Matter can be regarded as a reserve of energy and it can contain many types of energy, such as the rest energy E_0 , potential energy E_p , kinetic energy E_k , electromagnetic energy E_b , and one type of energy can be converted into another type of energy. In any chemical reactions or physical transformations, the system should follow the three conservation laws: mass, momentum, and energy. It is the use of these three laws to calculate the trajectory of particles in a system. Furthermore, the concepts of matter, anti-matter and unmatter by Smarandache (2005) are just a further subdivision of matter and they cannot replace the functions of mind.

Thus, my concept of matter is that any matter has mass, volume, density, and it can have positions, and it will move under the action of a force either internally or externally. Energy is just a property of matter similar as mass, momentum, and others. Mass is invariant. It is also my opinion that photon has a mass (Tu et al., 2005) and the zero mass result is derived by adopting the Lorentz transformation. Gift (2018) had argued that the Lorentz transformations contain an inconsistency and this can be overcome by using the Selleri transformations (Selleri, 1997; 2004). I do not make the same judgment as Gift but agrees that the zero-mass of the photon is caused by using Lorentz Transformations and it is not necessary the physical reality. Furthermore, I treat all the fundamental quantities, such as time, length, mass, temperature, force are invariants since they are defined and agreed by human beings, so we can apply a similar principle of Collective Time (CT) used in Global Positioning System (GPS) (Phipps, 2014; Sato, 2018).

In order to explain all the observed phenomena about lifeless objects and lives, we need to answer the famous mind-body problem (Popper, 1999; Skirry, 2016; Robinson, 2020). Currently, there is no explanation why a life can actively move while a lifeless object cannot. It is well-known that Newton's first law states that "an object will remain at rest or in uniform motion in a straight line unless acted upon by an external force". Some people interpret this law as "a system cannot bootstrap itself into motion with purely internal forces—to achieve a net force and an acceleration, it must interact with an object external to itself" (Hyperphysics Encyclopedia, 2005). However, it is obvious that this sentence is certainly not true for a living object like a man. Man can start to move by himself. From above observations, we can find that in general, three Newton's laws are only suitable for lifeless objects but not living objects.

The mind-body problem is a debate concerning the relationship between thought and consciousness in the human mind, and the brain as part of the physical body. It is distinct from the question of how mind and body function chemically and physiologically, as that question presupposes an interactionist account of mind-body

relations (Bunge, 1980; Skirry, 2016). This question arises when mind and body are considered as distinct, based on the premise that the mind and the body are fundamentally different in nature. The problem was first addressed by René Descartes in the 17th century, resulting in Cartesian dualism, and by pre-Aristotelian philosophers (Young, 1996; Robinson, 2020), in Avicennian philosophy (Lagerlund, 2010), and in earlier Asian traditions (Capra, 1975). A variety of approaches have been proposed. They are either dualist or monist. Dualism maintains a rigid distinction between the realms of mind and matter while monism maintains that there is only one unifying reality, substance, or essence, in terms of which everything can be explained. By examining carefully, modern sciences, such as general relativity and quantum mechanics have already moved from monism of matter only to dualism of matter and energy. For some others, information is assumed to be a fundamental existence in addition to matter and energy (Draganescu, 1990; Gaiseanu, 2020a; 2020b; 2021).

I answered this problem based on the relativity of simultaneity axiom; it is neither purely monism nor purely dualism but a combination of monism and dualism. If we stick to the monism, it can only be described by either emptiness or existence, both of them in a special meaning. For the emptiness, it cannot be seen but it can generate everything; for the meaning of existence, it can generate everything but it cannot be seen by us. If we want to describe the existence in a deeper level, it is a relative existence and at least two concepts have to be used, such as matter/non-matter, thus it is a dualism. The non-matter can be defined as energy or information or soul or other names, but since energy and information have other meanings, it is better to be called mind in order to match the famous mind-body problem. Energy is a property of matter while information can be thought to be generated by mind. From quantum mechanics, we know that matter exists in the form of quanta and let us call the assembly of unobservable quanta as aether, while observable quanta as particles. Then, aether and minds are the two fundamental existences of everything in the world we can observe. They are explicitly given by the following definition (Cui, 2021):

Definition 3. The essence of matter is defined as aether which represents ensemble of unobservable quanta. The essence of a life is defined as a mind.

It is well-known that the concept of aether has been abandoned in Einstein's theory of relativity (Einstein, 1916), but this is costed by the mis-use of the concepts of energy and field etc. By re-interpreting quanta as matter and energy is a property of matter, the fundamental existences in the world we are living are reduced to two: aether and minds. According to TOE-A1, both concepts should co-exist and only with both concepts we can explain how everything in the world is created without introducing the concept of GOD. TOE-A1 can solve the "creator" problem in materialism (Sarfati, 1998) and "creating some matter from nothing" problem in idealism. Let me introduce the following axiom which is also derived from observation through logical induction (Cui, 2021).

TOE-A4: The particle generation and annihilation axiom: Lives can accumulate aether into particles and decompose particle into aether.

Lives can be divided into microorganisms and macro lives, such as plants, animals, and human beings. The ability of doing this accumulation and decomposition is certainly different from one life to another. With TOE-A4, the origination of the world is explained based on the existence of aether and minds. This can avoid the creator problem in the materialism and the "creating an object from nothing" problem in the idealism. However, both aether and minds are out of observation and they can only be understood as two concepts for attributing uncertainty according to the current scientific research methods. In terms of the properties or characteristics of aether, minds and unobservable quanta, instead of selecting agnostic attitude to them, I

recommend an open-minded attitude that they may be able to be studied through other methods, such as meditation (Laumakis, 2008). Currently, we just take them as a convenience to replace the role of God to explain things since all our knowledge is a relative knowledge and we have to rely on some fundamental concepts to explain things.

Summary and Conclusions

In this paper, a unified ontology for the general system theory has been proposed which is based on the clarification of some fundamental concepts, such as universe, world, matter, mind, time and space, mass, energy, field and information. Based on the relativity of simultaneity axiom, I proposed that aether and minds are the two essences of the world we can observe and everything we can observe is created through the combination of aether and minds. A new force field called psychic field is proposed which can be regarded as the generation of active force while other existing four fields can generate passive forces. Obviously, more explanation on the existence of psychic force is required and this will be my subsequent work. Therefore, my ontology is slightly different from Bunge's realist ontology of "systemism" (Bunge, 1977; 1979; 1983a; 1983b). He is still in the category of monism while I am one school of the Buddhist philosophy, midway philosophy. Bunge's philosophical system may be characterized as: "materialist (or naturalist) but emergentist rather than reductionist; systemist rather than either holist or individualist; rational-empiricist rather than either rationalist or empiricist; science- oriented; and exact, that is, built with the help of logical and mathematical tools rather than depending upon purely verbal articulation" (Klement and Bandyopadhyay, 2019). By borrowing this summary, my philosophical system can be characterized as: midway of materialist and idealist with emergentist and reductionist; systemist of holist with individualist; rational and empiricist rather than either rationalist or empiricist; science- oriented; and exact, that is, built with the help of logical and mathematical tools rather than depending upon purely verbal articulation.

Due to the existence of minds and psychic forces, many phenomena previously explained by non-intuitive axioms in GR and QM can be avoided. For example, the information generation is attributed to minds and the quantum entanglement is explained by the entanglement of minds and it has no difference whether the body is micro or macro scale. Recent experimental evidence that quantum entanglement goes large (Kotler et al., 2021; Mercier de Lépinay, Ockeloen-Korppi, Woolley, & Sillanpää, 2021) provided a good support for this explanation.

Through this new model of mind-body relation, the difference between intelligence of living creatures, such as human beings and animals and artificial intelligence is very clear and this may solve the cyclic developmental issue of AI spring and AI winter (Mitchell, 2021).

In order for readers to understand the whole picture of my ontology for the general system theory, a brief summary of the main points of this paper is given as follows.

1. Language is a construct of living creatures and everything we can describe in language is a relative existence, at least a pair of concepts has to be used. Whether we use a two-valued logic (divide the whole sample space Ω into A and non-A), three-valued logic (divide the whole sample space Ω into A, anti-A, un-A), multi-valued logic or even continuous logic from 0 to 1 (fuzzy logic) do not change the nature of the problem. For simplicity, a two-valued logic system is used in this paper for demonstration.

2. The conflict between traditional monist philosophy, such as materialism, idealism, Christianity and dualist philosophy can be unified. It is neither monism nor dualism or it is either monism or dualism since both

A and non-A are created by the division of intelligent lives and they occur at the same time. We can call this philosophy as a Midway philosophy which is one school of Buddhist philosophy (Laumakis, 2008). Thus, the existence of intelligent lives is a prerequisite to talk about all the theories. So the origin of lives is the same as the origin of the universe and it cannot be explained within the framework of a scientific theory. Instead, any scientific theory must be built on the foundation of the existences of the universe which contains intelligent lives and various lifeless objects. By assuming the pre-existence of the universe, we can explain the origin and the destroy of a particular world which can be observed by our human beings.

3. In order to describe the movement and change of an object, we need to introduce many pairs of concepts, such as time and space, move and rest, matter and mind, universe and world, finite and infinite, reducible and irreducible, reversible and irreversible, observable and unobservable, measurable and unmeasurable, deterministic and probabilistic, hot and cold, absolute and relative, living and lifeless. All these concepts are of relative sense if we have created an imaginary concept of absoluteness similar as we call some object in movement since we have the concept of rest. So, a concept A is relative if it is compared with B but at the same time it is absolute if it is compared with C. That is, the relativity and absoluteness themselves are relative.

4. If we want to divide the theories into scientific and non-scientific (pseudoscience), we need to establish some demarcation criterion. The criterion I suggested is clear definition, logical consistency and unfalsified axioms (Cui, 2021). Each scientific theory contains four parts, axioms induced from finite observations, theorems deduced from axioms, observed phenomena, logical analysis method, such as induction and deduction. Based on this criterion and the relativity of simultaneity axiom, I offered a strict definition for science (Cui, 2021): Science is a set of clearly defined and logically consistent knowledge about the structure and behavior of the natural and social systems obtained by watching, measuring, and doing experiments in the form of testable explanations and predictions about the system we can observe within the world we are living.

5. From this definition, I emphasized the fact that science can only study a very small part of the universe and cannot address any questions related to the whole universe. Any statement supposed to be valid for the whole universe violates the testable requirement of science. All the knowledge we have is of relative truth, that is, based on the fact that we have ignored or only partly considered the influence of the rest universe to the system behaviour.

6. So by assuming the pre-existence of the universe and its infinity of spacetime, we can study the origin of the earth, the moon, the sun, the solar system, the Milky Way or any system of finite spacetime. This follows the same process as we design a house and construct a house and then we stay in the house and the house is finally broken.

7. The most fundamental building blocks for the world we are living are defined as aether and minds, they are ensembles that we have not name their each individual component. The properties of each individual component in this ensemble called minds or aether may be different and since we have not developed the apparatus to measure them, so we do not know them. This is similar as those stars we have not detected and we could not name them. We cannot distinguish the individual components in the ensembles of minds or aether at the moment does not imply that we cannot distinguish in the future.

8. Different from Copenhagen school who claim that there exist some properties in the microworld which we can never be known, I recommend to be open-minded. There may exist some other observation method, such as meditation which can be used to better observe the behaviour of minds and aether.

9. Currently we can only use science to study those objects which can be observed through our naked eyes

plus the help of telescopes and microscopes. Each object is created by one or more lives by accumulating the aether and each object can be destroyed into small objects or even aether and these processes are called physical or chemical processes. In these processes, some conservation laws should be followed, such as the conservations of mass, momentum and energy.

10. Thus, we encounter the problem of epistemology, whether the world is operated with laws or randomly. It is my logical deduction that we have to assume that all the systems or everything in the world we can observe is operated with causality law and the mission of scientists is to reveal these laws and we can use these laws to predict the future. Without that belief, scientific research is a paradox.

11. Force is defined to be a physical quantity used for describing the interaction between two objects and for more than two objects, the concept of a field is used to explain the force phenomena. I proposed the existence of the fifth force which is caused by the entanglement of minds and every living creature can generate a psychic field around him similar as the gravitational field generated by the mass and any other living creature will be subjected to a psychic force within this field. Different from the four existing forces which are all passive, the psychic force is active and the living creature can adjust and control its magnitude and direction at any time. Thus, many phenomena can be explained using this new force. The existence of this force (Psychokinesis phenomena) has more or the less confirmed (Cardeña, 2018). Of course, how to measure and control it needs further researches.

12. Information is also regarded to be generated by minds and it could be recorded in a matter medium to be transmitted. However, direct transmission through mind entanglement is also regarded to be possible and it could be superluminal (Lee, 2019). Since minds cannot be destroyed, thus, information cannot be destroyed when it is generated and information can influence the behavior of minds.

13. In summary, in this ontology, the universe itself is an entity which exists forever and it has lifeless objects and lives as we observed and defined. We human beings are one type of lives in the universe. Through our feeling, we find everything is in movement and change. In order for communication among our human beings we developed language and assigned many names to the objects we have seen. In order to describe things, we at least use a pair of concepts. For example, the first division is human beings and non-human beings called nature. The theory for the nature is philosophy and the theory for human beings is religion and before that it is a theory of everything for the whole universe. Later, from philosophy more sciences including mathematics are developed while philosophy is reduced. Furthermore, scientific approaches are used to study human beings, more social and life sciences are developed. Now it is a time to extend the general system theory to the theory of everything for the world we can observe rather than the whole universe. This is based on the realization of the limit of scientific approaches which can only be confined to the world we can observe rather than the whole universe. A system is a general concept for every problem we encounter but we decompose the complex system into simpler components. We should not forget the emergent properties occurred through the interactions among components. A general picture of the system decomposition is shown in Figure 2, the emergent properties occurred through the interactions among subsystems (or components) are particularly emphasized. With that model, the general system theory can be regarded as a theory for everything. In some cases, the emergent properties occurred through the interactions among components can be neglected and this is the René Descartes' reductionist approach and previous Newtonian mechanistic theory. In quite a lot of situations and especially for those systems which contain living creatures, the emergent properties cannot be neglected. By fully considering these emergent properties, the general system theory is basically a theory of

everything. Basically the exchange between system and the environment are two things: matter and information. Matter exchange leads to the exchange of energy, momentum and force. Information exchange can be transmitted through traditional means, such as through vehicles or physical waves or through the entanglement between two minds or among multiple minds. The new means of the information transmission through entanglement should be the focus of current science.

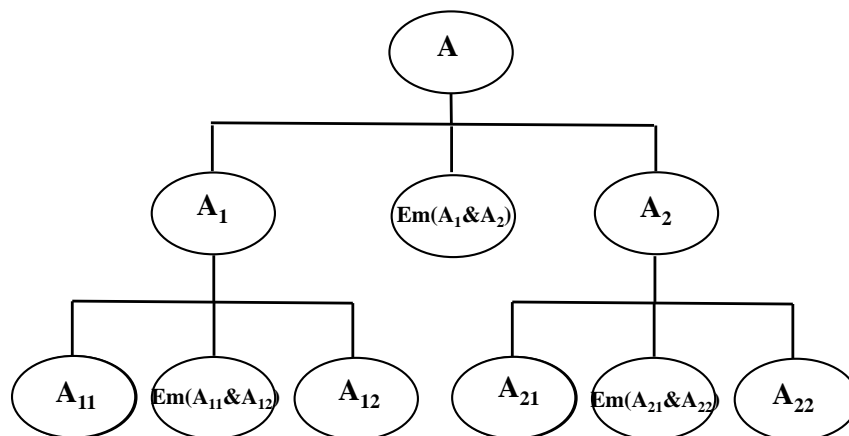


Figure 2. A schematic diagram for general system decomposition.

Acknowledgement

Critical comments from two anonymous reviewers are greatly appreciated and they are very helpful for improving the quality of the paper. This work was supported by the General Program of National Natural Science of China “A study on the water absorption property of the buoyancy material for the full ocean depth manned submersible” (Grant No. 51879157), the “Construction of a Leading Innovation Team” project by the Hangzhou Municipal government, the startup funding of New-Joined PI of Westlake University with grant number (041030150118) and the funding support from the Westlake University and Bright Dream Joint Institute for Intelligent Robotics.

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