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A Grand Unified Life Theory:

An Extension of the Self-nonself Circulation Theory

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Truths cannot be "taken over"; they have to be rediscovered continually. They have ever to be re-formed and transformed, if they are to preserve their meaning, their living value, or their spiritual nutriment.

Lama Anagarika Govinda, p39
"Foundations of Tibetan Mysticism" Marino Publishing 2012

Abstract. In *Kyoto Manifesto*, Masatoshi Murase (2018) discussed "A self-similar dynamic systems perspective of living nature" based on the self-nonself circulation principle (Murase, 2000; Murase, 2008a; b) to investigate self-transcendental behavior beyond the traditional dichotomy of self (or subject) and non-self (or object) typical of Western science.

This study extends the self-nonself circulation principle to understand the complex behaviors of "living" nature. The dynamic interactions between the self and non-self are conducted through five successive processes: ①Negation, ② Expansion, ③ Convergence, ④ Transference, and ⑤ Emergence. Based on the first letters of each process, it is called the *5-NECTE* principle. Interestingly, evolution and learning processes would be explained based on the 5-NECTE principle (cf. Murase and Mursae, 2020a; b). It is now time to demonstrate that a grand unified theory of life could be described as an extension of the self-nonself-circulation theory (cf. Murase and Mursae, 2020a; b).

Keywords: ①Negation, ② Expansion, ③ Convergence, ④ Transference, ⑤ Emergence

1. Introduction

Western science has indeed discovered numerous important principles among the diverse phenomena in nature based on the assumption of simple relationships between cause and effect. In understanding such cause-effect relationships, we acknowledge that the duality of A and not-A must play an important role (see the upper panel of Figure 1). However, there is an alternative perspective that can provide field-like thinking that is typical of Eastern philosophy (Murase, 2008a). We should not always assume the duality of A and not-A, but instead, also consider the coexistence of A and not-A and even the absence of A and not-A, which is known as tetra lemma (see the lower panel of Figure 1).

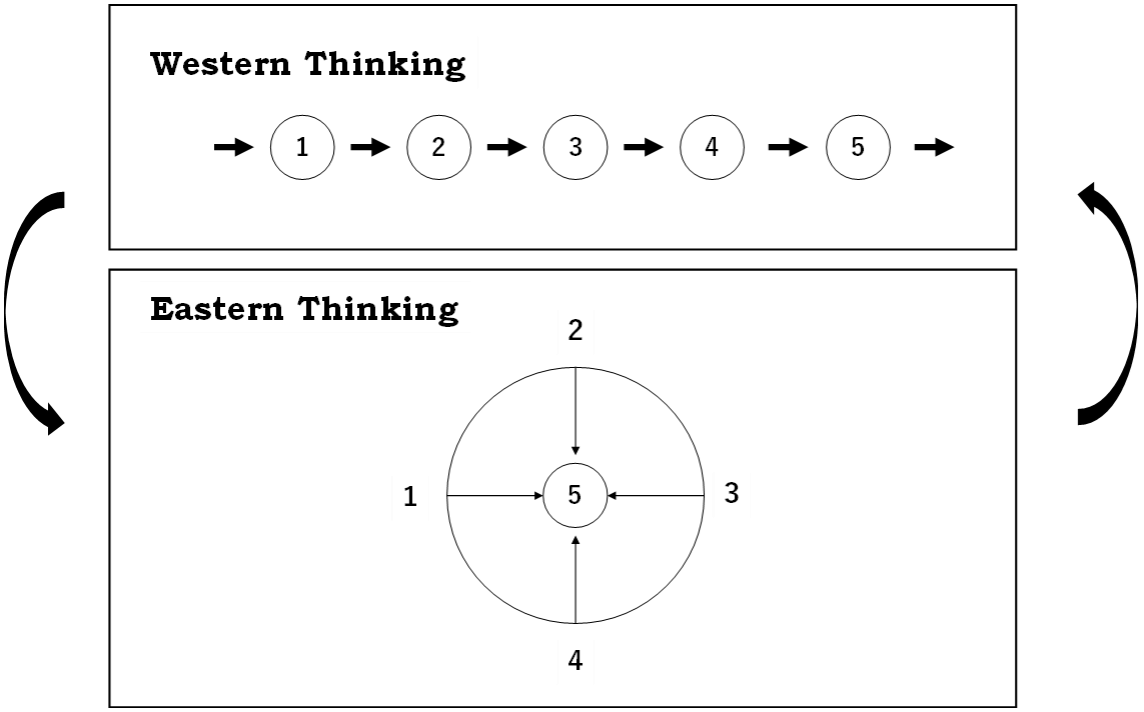

Figure 1: Western thinking and Eastern Thinking

Murase and Mursae (2020a; b) pointed out the plausible problem inherent in the tetra lemma because it may fail to explain the origins and evolution of the tetra lemma. We are familiar with the principle of reductionism, where objects are analyzed based on their elements. However, it is extremely difficult to distinguish the difference between living life and non-living matter even if we analyze the objects into their elements because they are not usually different from each other (Murase, 2000). Concerning complex systems, individual elements are not always important for understanding their whole dynamics because systems with different scales may show similar behaviors, regardless of their elements. Logics thus play important roles in dealing with the logical perspectives underlying systems behaviors, as logics can be applied to any kind of elements. Indeed, different kinds of logic, such as fuzzy logic (Murase and Mezey, 2020) and Chinese logic (cf. Sim and Vasbinder, 2020), have been considered in addition to the tetra lemma.

From the perspective of a new synthesis, it would be interesting to consider a third possibility for understanding the complex nature of living systems. This study tried to demonstrate how elements, processes, and logic would exchange their roles with each other during evolution and learning dynamics. This is the appropriate extension of the self-nonself circulation theory described in the paper by Murase (2018).

2. The Self-nonself Circulation Theory of Life

As we are familiar with the traditional way of Western thinking, we usually assume that an observer is absent in the framework of the scientific scheme. Figure 2 shows how an observing subject can understand an observed object in two different ways.

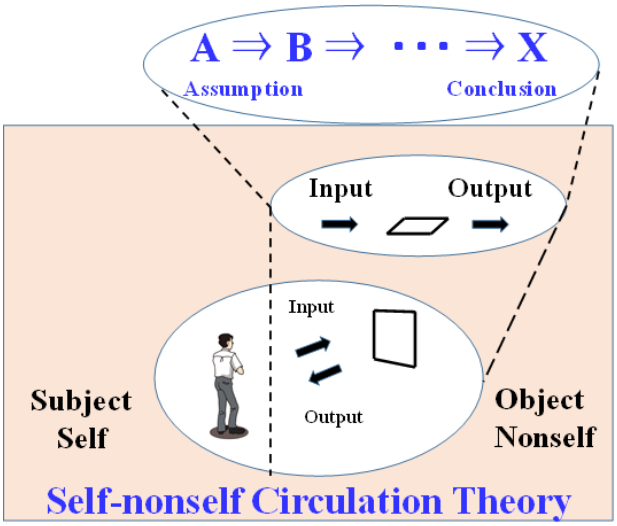

Figure 2: The upper panel shows cause-and-effect relationships at the level of an object. The lower panel indicates the presence of an observer.

The upper panel shows the traditional Western way for understanding the input-output relationship at the level of the object without considering the influence of the subject's presence. Owing to the observing subject's absence, it is easy to understand how we can reproduce the results of previous studies. The lower panel indicates the actual relationship between an observing subject and the observed object in the circulation process This is called the self-nonself circulation process, as illustrated in Figure 3.

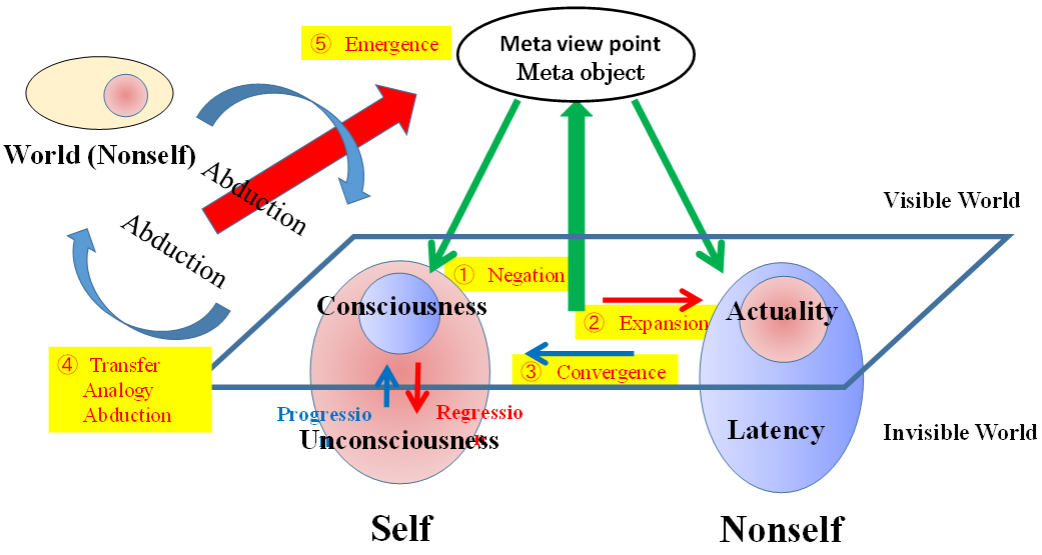

Figure 3: Dynamics of the Self-nonself Circulation Theory

As shown in Figure 3, a self (or a subject) has its own conscious and unconscious mind. Likewise, a nonself (or an object) has its actuality in the visible world and its latency in the invisible world. The dynamic interactions between the self and non-self are conducted through five successive processes: ① Negation, ② Expansion, ③ Convergence, ④ Transference, and ⑤ Emergence. Based on the first letters of each process, it is called the *5-NECTE principle*. It is extremely important to realize that the self-nonself circulation theory always contains the 5-NECTE principle.

2.1. The 5-NECTE Principle

According to Edwards (1987), there are some common processes shared across various creative problem-solving methods. In the 19th century, a physicist called Helmholtz introduced three processes: ② Saturation, ③ Incubation, and ④ Illumination (see the upper panel of Figure 4). In the terminology of logics, saturation, incubation, and illumination correspond to *deduction*, *induction*, and *analogy* (or *abduction*), respectively.

Importantly, a mathematician called Poincare introduced an additional process called ⑤ Verification in 1908 because it is necessary to check whether the hypothesis is valid in a mathematical sense (see the second panel of Figure 4). About half a century passed when a psychologist, Getzels, suggested the importance of the first process and named it ① "the problem finding" before ② "the Saturation process", and finally there appeared the five different stages: ①Problem finding, ② Saturation, ③ Incubation, ④ Illumination, and ⑤ Verification (see the third panel of Figure 4).

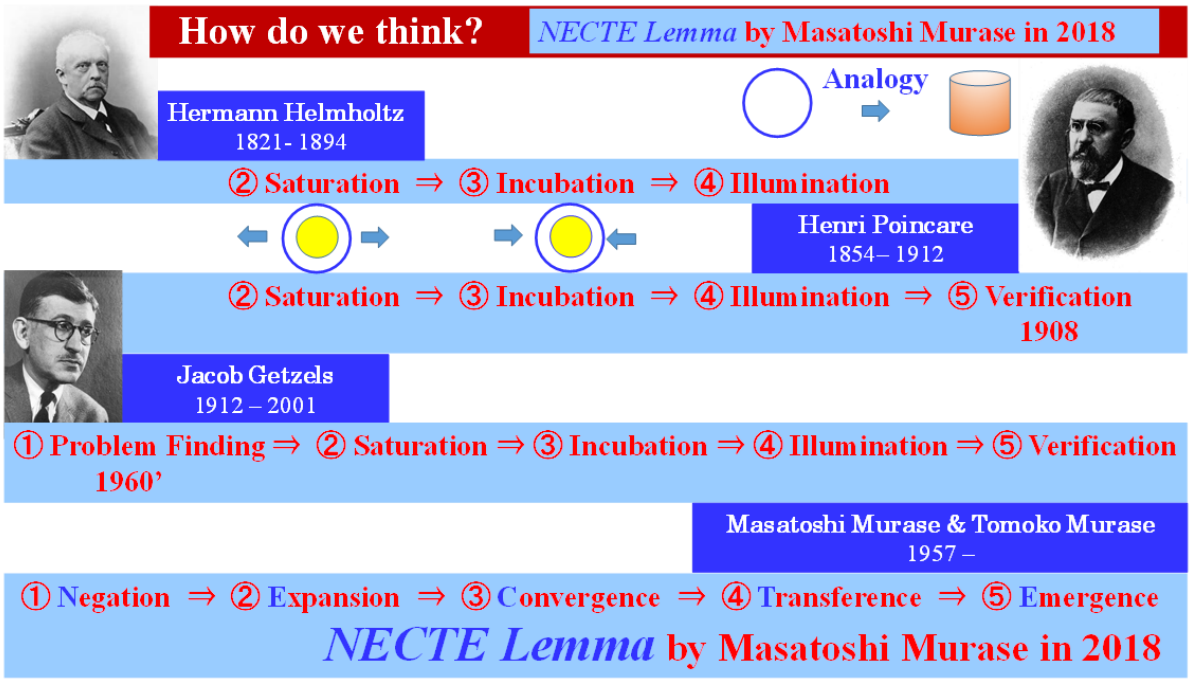

Figure 4: The 5-NECTE principle

Following all these considerations, the five different stages are renamed by five different processes: ①Negation, ② Expansion, ③ Convergence, ④ Transference, and ⑤ Emergence, and thus the 5-NECTE principle (or lemma) was introduced. As mentioned above, the dynamic interactions between the self and non-self are conducted through the 5-NECTE principle. It is now clear that the self-nonself circulation theory is a useful model for understanding not only cellular dynamics (Murase, 2008; 2018) but also the learning processes.

2.1.1 Evolutionary processes conducted through the NECTE principle

In 1959, Charles Darwin published his evolutionary theory, which was based on *natural selection*. Interestingly, the underlying dynamics of this theory turned out to be conducted through the 5-NECTE principle processes as illustrated in Figure 5.

The relationship between then natural selection theory and the 5-NECTE theory is described as follows. ① Negation is related to the occurrence of mutations at the level of individual organisms. After the mutation, ② the expansion of many different kinds of organisms occurs. Subsequently, some of the organisms disappear due to their maladaptation to the environment, thus leading to convergence. As it is not clearly shown in the evolutionary trees of Darwin's original figure, any living organism could move successively from one habitat to another to find foods and so on. This is the case for ④ transference. Finally, after adapting to the new environment, new species will appear in a process known as ⑤ emergence.

It is also interesting to note that Darwin imagined the natural selection theory based on *"Principle of Population"* by Malthus. Indeed, Darwin recognized the analogy between the population of living organisms and that of human beings. This kind of sudden realization of analogy between different complex phenomena corresponds to "transference" as shown in Figure 4. This will be discussed in the next section.

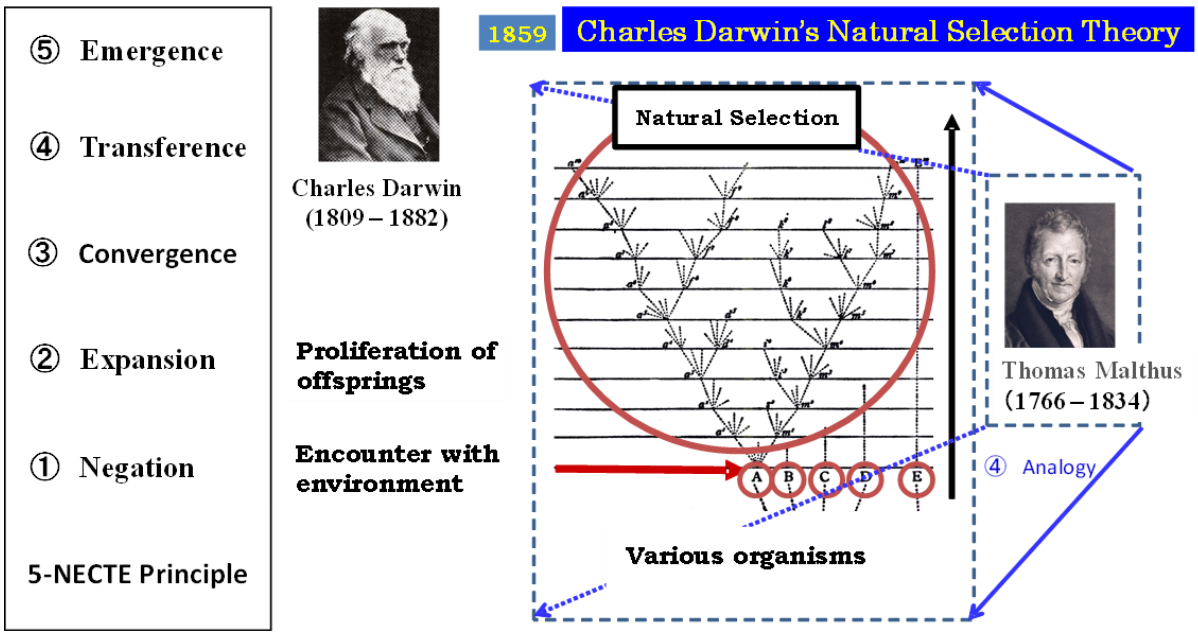

Figure 5: Evolution conducted through NECTE Principle

2.1.2. Learning as an Evolution Process conducted through the NECTE Principle
The same 5-NECTE principle could conduct considerably different dynamics—for example, learning and evolution. Here, the 5-NECTE principle can be understood as the *scale-invariant principle* among diverse life phenomena.

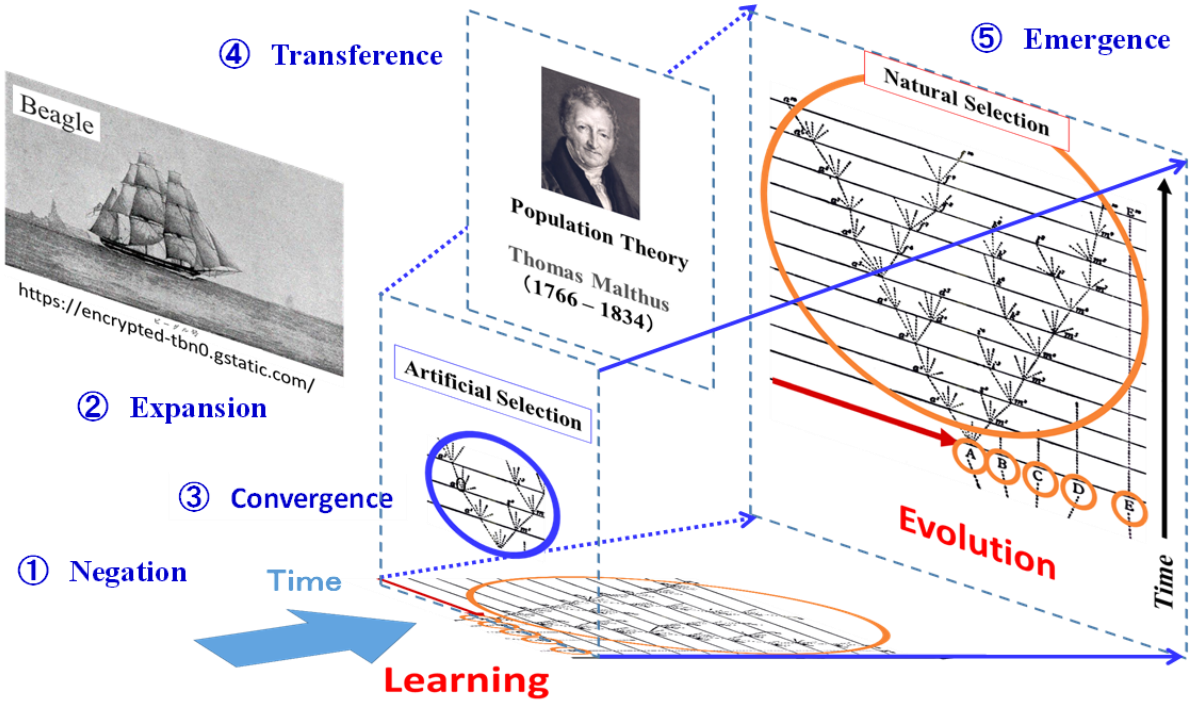

Figure 6: Learning and Evolution conducted through NECTE Principle

Figure 6 shows that the learning process or the emergence of new theory by Charles Darwin and his theory of evolution are both conducted by NECTE Principle. ① The negation of pre-existing perspectives is required for the beginning of new theories regarding biological evolution. ② The expansion of perspectives is also important for understanding the essential features of biological phenomena. ③ The convergence of a particular hypothesis among the collected perspectives is necessary. Subsequently, the ④ transference of the hypothesis into a different discipline is often induced by Analogy. Finally, the ⑤ emergence of the new theory occurs. The dynamics of all the 5-NECTE principle will be found in the evolutionary processes, which is not surprising because both are biological processes.

2.1.3 Transformation of a simple chain-like relationship into field-like conformation
It is now time to consider how the linear chain relationship contributes to the formation of field-like views. In Figure 7, the five numbers represent the 5-NECTE principle processes. During the learning or evolutionary processes, it is not always necessary to have linear chain-like dynamics at all; however, instead, the chain-like conformation could be rolled into different shapes, just as in the case of DNA molecules or amino acid molecules (see Murase, 2018).

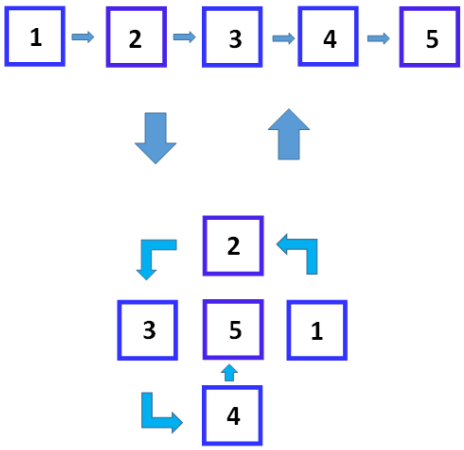

Figure 7: Chain-like relationship and field-like conformation

An interesting thought emerges with regard to the similarity between Figure 1 and Figure 7. In Figure 1, we discuss the situation between the Western way of thinking and Eastern way of thinking. In Figure 7, we now consider the case of both evolution and learning processes, which can be easily transformed from an open chain to a closed chain.

2.2 Dynamic relationship between open chain and closed chain

Hideki Yukawa, who was awarded the Nobel Prize in Physics in 1949, considered that the interaction between the two objects would be conducted through the elementary particle to understand the nuclear force. Interestingly, these elementary particles are not only the contents of each object but also the interactions themselves (see upper part of Figure 8).

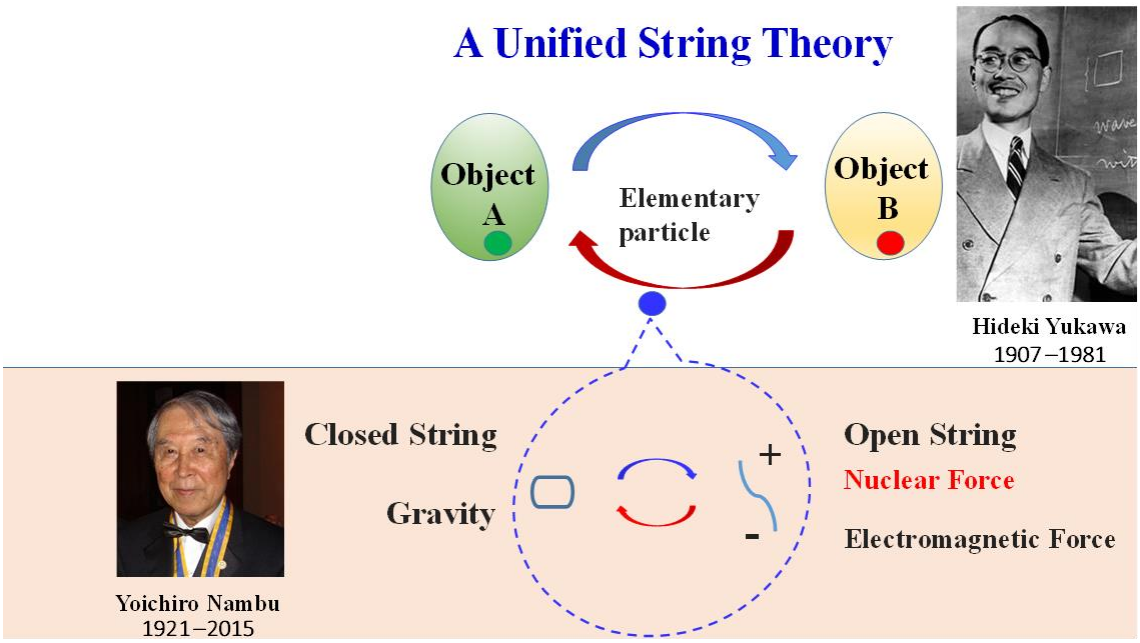

Figure 8: A unified string theory

Yoichiro Nambu, who was awarded the Nobel Prize in Physics in 2008, introduced a revolutionary theory oncerning elementary particles. He suggested that the elementary particle is not a "particle" but, instead, a "string." Such a string could change its shape from open to closed, and vice versa. Consequently, the theory could explain not only gravity but also the electromagnetic forces.

Similarly, the present consideration suggests that the change between the two different conformations such as chain- and field-like conformations could play important roles in improving our understanding of complex situations.

3. Discussions

Nature and life phenomena are complex, and thus, it is extremely difficult to understand what kind of principle is conducted among the diverse phenomena. This study suggests that there is a scale-invariant principle that could provide us with an understanding of such diverse phenomena.

The important guiding perspective is that nature and life phenomena must be conducted based on the same principle. In other words, we need to understand the same principle in order to understand the complex phenomena. We should specify the tools used to investigate the objects. However, the tools themselves are hidden in objects. In addition, we (or subjects) ourselves must be conducted based on the same principle. It is interesting to realize that subjects, objects, and the relationships among them are all conducted based on self-nonself circulation principle.

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