General Variation Theory: A Perspective of Generalized Science

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**ABSTRACT**

The representative discussion on “variation” originates from Life Science; however, “variation” also exists in the fields of Natural Science, and Humanities and Social Science. And each of these three fields has certain continuity and internal consistency in their “arche” (αρχή) and “variation” processes. Particle variation, gene variation, and meme variation occur in nature, life, and culture respectively; they all start with “hereditary” with specific structure and evolve into various things that can be perceived by experience in various fields via the “selection” of an “invisible hand.” This process is clearly described in natural philosophy and metaphysical realism, which can be summarized as the generation theoretical and dualistic “ontology-variant” variation view. Through a full view of generalized science, a knowledge chain of “variation” is extracted, which is referred to as “general variation theory” in this article. This theoretical concept consists of four closely related parts: basic variation, nature variation, life variation, and cultural variation. Each of them has its own independent question domain and knowledge model; while, at the same time, there is a certain continuous, inclusive, and integrated relationship running through these four parts, thus generating a universal explanatory effectiveness in this sense.

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At present, generalized science, including Natural Science, Life Science, and Humanities and Social Science, is marked by high specialization, institutionalization, and...
fragmentation. Although this status quo has characteristics of both interdisciplinary and cross-over study that cannot be obliterated, these studies, on the whole, are mostly confined to the scope of related or adjacent disciplines. An overall systematic and integrated research is relatively weak. However, as Max Karl Ernst Ludwig Planck, one of the core founders of quantum mechanics, said: “Denn die Wissenschaft bildet nun enimal sachlich genommen eine innerlich geschlossene Einheit. Ihre Trennung nach verschiedenen Fächern ist ja nicht in der Natur der Sache begründet, sondern entspringt nur der Begrenztheit des menschlichen Fassungsvermögens, welche zwangsläufig zu einer Arbeitsteilung führt. In der Tat zieht sich ein kontinuierliches Banf von der Physik und Geisteswissenschaften, ein Banf, das sich an keener Stelle ohe Willkür durchschneiden läßt” (Planck 234). The discretization of knowledge and autonomy of different disciplines or groups of disciplines indeed exist rather than ought to exist; the “continuity chain” that runs through the fields of independent disciplines does exist. With a clue of change and variation, this article tries to explore the relationship of inclusion and continuity through the “knowledge archaeology” in Philosophy, Natural Science, Life Science and Social Science, so as to sort out a knowledge chain with internal unity, which is called “general variation theory” in this article. This theoretical concept will in turn have a general explanatory effect on the variation phenomenon with inclusion and integration relations imbedded in the fields of nature, life, and culture.

1. “Every change has its principle”: motion change and variation in metaphysics and natural philosophy

In current knowledge system of various disciplines, the most typical discussion on “variation” comes from Life Science, in which the theory of “Genovariation” has a wide influence on other subjects. From a philosophical point of view, the general definition of “variation” in Life Science is “difference between species and individuals,” which cannot be reduced to the category of “entity” in the Aristotelian sense. On the contrary, it can both “declare a subject and depend on a subject.” In other words, there is always “X’s variation” rather than “vary X.” It can be seen that the word “variation” can only act as a predicate or attribute, which means that there must be some kind of unchanged “entity” as its infrastructure. Philosophical inquiry shows precisely that the apparent manifestation of complex variations can always be traced back to some invariable setting; or, in other words, sensible variants are merely logical extensions or derivatives of abstract “ontology.” This concept constitutes a basic thinking pattern of “variation” from the perspective of philosophy, which has been widely discussed in both Eastern and Western philosophy.

The Book of Changes《周易》is the first classical book in ancient China to systematically explore the changes, birth, and death of all things in the universe. Its expositions and annotations on “yi” (易) are helpful to understand the above questions. Zhong Xuan of the Eastern Han Dynasty pointed out in易论 that “Yi has only one name but contains three meanings: simplicity易简, change变易, and immutability不易.” The second meaning, namely, change变易 implies motions and changes of everything; the first meaning, simplicity易简, indicates that The Book of Changes can reduce abundant changes of the universe to simple philosophical principles, thus making people “easy to know”(易知) and “easy to follow” (易从). When this simplification reaches its extremity, a third
meaning is formed, namely, “immutability,” meaning “a fundamental law of the change of the universe is unchanged,” which is “Tao” or “ontology” of the universe (Zhang 3–8). It is a typical metaphysical thinking to abstract something unchangeable from various changes and regard it as the highest principle; it means that “change” and “simplicity” as explicit phenomena are subject to the “immutability” of ontology, just as the expressions of various traits of organisms are always subject to the specific structure of the genome. But philosophically, such abstract settings tend to be dualistic, describing ontology as an immovable, unchangeable, and immortal existence or entity. In this way, it distinguishes it from the ever-changing world. For example, it is pointed out in Xici in The Book of Changes that “Yi, without thinking, without doing anything, without moving, gets access to the truth of the world by sensing” (“易,无思也,无为也,寂然不动,感而遂通天下之故”). “Yi” here also indicates the meaning of “immutability,” which can remain unchanged without thinking and doing, and become the highest ontology through getting access to the truth of the world. In addition, The Doctrine of the Mean 中庸 holds that “it could present itself even without showing it; it would change without moving; it would come into being without doing” (不言而章,不动而变,无为而成); while Zhuangzi mentions that “the creator surpasses the things created by the creator; the one who can convert surpasses the things that have been converted” (生物者不生,化物者不化), and so on. Accordingly, Qian Zhongshu points out that “change cannot be out of order. One can be different, and to present quietness through motion. That is the reason why people in ancient time always talk about the heaven’s fortune” (Qian 6–7). In this case, the immutable “order” (常), “one” (一), “essence” (体), and “quietness” (静) not only dominate “change,” “difference,” “utilization,” and “movement” as their perceptual manifestations, but also tend to be accompanied by the tendency of metaphysical materialization as the “creator” and “converter.” In this way, all things in the world are derived, which is also the basic connotation of “life is endless and it moves in a circle; innovation is the origin of all things” (生生之谓易) in Xici of The Book of Changes.

The same is true in Western philosophy. For example, Heraclitus believed that “the world is an eternal fire, which burns and extinguishes in a certain degree.” The world, as a “living fire,” is certainly changing constantly, even “everything changes, nothing lives forever”; however, on the other hand, such a “certain degree” is constant. Heraclitus called it Logos, which is an abstract rule of “constant immobility without birth and death” (Zhao 48). Parmenides simply denounced the changeable perceptual world as an illusory “non-being,” and concluded that behind it certain abstract and unchanging “being” is the only true existence. Plato regarded Parmenides’s view of being as a universal essence independent of concrete things, that is, eidos. In Plato’s view, only through “imitating” or “sharing” eidos can all things be created. Eidos is also a motive force for constant movement of all things in the world, which drives things to move toward it by giving them external forms. Aristotle, however, did not think so. He held that the eidos is not independent from the substance. Therefore, the movement of things is inherently changeable, and is always directing toward some end, beyond which there is a higher level of end, and thus constituting a continuous flow of motion. But just as mathematical limits and infinity can’t bring practical knowledge, this process cannot extend meaninglessly and infinitely. Aristotle therefore pointed out, “there exists an enabler who is moving without being pushed. This enabler is the eternal thing, the substance, and the reality” (Aristotle 243). It can be seen that a certain “unmoving mover” not only
promotes the movement of all things, but also acts as the ultimate realization, that is, to transform into “pure form,” which is also called the imperceptible and immovable “first entity.” It is precisely under its impetus that two kinds of entities consisting of perceptible material work in an orderly manner: one is the second entity that is indestructible and perpetual in circular motion, mainly referring to celestial stars; the other is the changing third entity, which is known as “the world under the moon” (Nie 138–54).

From “the world is an eternal living fire” to “everything is the sharing or the imitation of eidos” to the promotion of all things in the world by “motionless movers,” metaphysics embodies the tendency of materialization to varying degrees, that is, natural philosophizing. The latter is deeply rooted in Western philosophy. Thales pioneered natural philosophy. He believed that all things originated from water. Empedocle further pointed out that all things consisted of four elements: water, fire, soil, and gas; Anaxagoraras proposed that the world was bred from “seeds”; Leucippus and his disciple Democritus put forward the “atom theory,” believing that the atom as “being” and the void as “non-being” together constituted the origin of all things. All these means that everything in the world can either be traced back to a certain starting point in time, or it can be restored to some original structure or model in space. These concepts are very close to modern Life Science. For example, some geneticists believe that almost all animal heteromorphosis evolve from 13 Hox homeobox genes clusters formed in the late Protozoic era in geological history (Shu 1–9). In fact, Anaximander, who believed that all things originated from “ἀνεπίπον,” first put forward the idea of evolution; while Aristotle, as master of ancient Greek philosophy, has a fairly perfect description of the “great chain of being” in his works, such as Historia Animalium and De Plantis.

In short, metaphysics and natural philosophy set different ontologies or origins of all things from different perspectives: the former emphasizes universal essence of invariability, immovability, invisibility, and formlessness, while the latter tends to think that all things can be traced back to an eternal structure or basic element. However, just as mentioned above, metaphysics is often unavoidably naturally philosophized. If it pushes its ontological negative description3 to the extreme, it will produce a thought of “everything comes from nothing.” Remarkably, it is this idea that contains a complete map of the creation of the universe, including a clear roadmap of “variation” and “evolution.”

Laozi is a representative of this theory in China. In Tao Te Ching, he points out that “the myriad creatures in the world are born from something, and something from nothing” (天下万物生于有,有生于无) (Lau 61), and further claims that “nothing” implies “Tao.” He says: “There is a thing confusedly formed, born before heaven and earth. Silent and void, it stands alone and does not change, goes round and does not weary. It is capable of being the mother of the world. I know not its name, so I style it ‘the way.’ I give it the makeshift name of ‘the great.’” (有物混成, 先天地生. 寂兮寥兮, 独立而不改, 周行而不殆, 可以为天地母. 吾不知其名, 强字之曰: 道. 强为之名曰: 大) (37). On the one hand, “Tao” means “Tao of all things,” which has a clear ontological direction; on the other hand, it can cultivate the whole world as Tao Te Ching expresses, “The way begets one; one begets two; two begets three; three begets the myriad creatures” (道生一, 一生二, 二生三, 三生万物) (63). Such thinking is no different from previous views in The Book of Changes: the book interprets the highest “Yi” as “immortality,” which can “get access to the truth of the world by sensing” (感而遂通天下之故), and thinks that “Taiji, as one of the origins of Yi, is born yin and yang; yin and yang born
four images; four images born Bagua; Bagua determines good or bad; good or bad determines life cause” (易有太极, 是生两仪, 两仪生四象, 四象生八卦, 八卦定吉凶, 吉凶生大业) (The Book of Changes). In addition, the theory of “vital essence” (精气说), the theory of “vitality” (元气说), Neo-Confucianism, and the theory of mind, and so on, all affirm that some “being” acts as the abstract essence of all things as well as the source of its birth. Once these “ontologies” with negativity are materialized, they will inevitably lead to the thought of “being out of nothing.” At the same time, the inherent dialectical characteristics of ontological philosophy make the formation process of the universe graphical and descriptive. In this sense, the whole empirical world begins with certain “being” or “entity” and deduces according to certain mathematical rules, just as nucleotide substances in biology gradually vary and recombine according to certain structural combinations, so as to form a complex life world.

The idea of varying from a primordial setting so as to form a clearly identifiable genealogy of all things is of long standing in Western philosophy. For instance, Pythagoras believed, “Number is the origin of all things. 1 is the origin of numbers, and 1 as well as 2, 3, 4 composed of 1 have spatial significance: 1 is a point, 2 is a line, 3 is a surface, and 4 is a body. From 1 to produce other numbers, and from the number to produce everything, this process has been described as from point to line, line to surface, and surface to body. And then the four basic natural substances, including water, fire, soil, and air, are formed by the body in different arrangements, and finally . . . constitute everything” (Zhao 67). Plato’s theory of eidos, for example, divides the world of eidos into six levels: supreme goodness, esthetics and morality, philosophical category, number and mathematics, man-made things and natural things. Being imitated and shared, these different conceptual systems form a ladder-like perceptual world.

Georg Wilhelm Friedrich Hegel’s philosophy is particularly prominent on this point. The famous dialectical movement of thesis-antithesis-synthesis constitutes the basic framework of Hegel’s philosophy, and its process starts from the simplest and the emptiest concept, namely, “Sein.” This concept has no definitive property other than expressing the determination of “Zu-Sein” (去存在); so it is also its opposite – “non-being” (非存在). The two, therefore, form a unity of opposites, and constitute the first “concrete concept” that really contains specific contents, namely, “change,” meaning the contradictory movement of “being” and “nothing.” At the same time, because this concept has been endowed with inherent definitive property, which can also be called “quality,” it enters a new syllogism cycle: “quality” can only be revealed by the definitive property of “quantity” as its opposite, and the two are further unified as “degree.” Ontology ends here. And later it enters into essentialism, and then into the third stage, conceptualism. When the dialectical movement of the three comes to the end, it enters into natural philosophy; starting from the simplest and lowest inorganic substances, it undergoes mechanics, physics, and organic theory, and eventually evolves into human society and human spiritual world. Hegel’s ontological narrative, like the mechanism of a Russian doll, undoubtedly expresses a high-definition mathematical map of the creation of all things. If we erase the criticized syllogism and the ultimate philosophical conclusion of solipsism, it is almost a philosophical replica of DNA and protein macromolecules from nothing to being, inorganic to organic, and simple to complex. Here are two points of particular concern:
First of all, Hegel has expressed his profound thought of “change (variation)” in the process of evolution of all things. The dialectical syllogism of being-nothing-change shows that “change,” as the first concept with specific content, arises spontaneously because it contains contradictions and oppositions. Therefore, it is conditional, with a starting point, even if such conditions and starting points are derived from the void “Sein.” Similarly, “variation” in Life Science does not come from nowhere. It must be based on some kind of sustainable foundation (DNA molecule), which is not without evidence but lays a more fundamental foundation (elementary particle) behind it. In this sense, the real process of variation will start from the latter, the deepest source, and will occur universally in nature, life, and society. Hegel sometimes refers to his idea of change as “variation” or “Entfremdung.”

Secondly, the starting point of Hegel’s dialectical “variation” is “Sein,” which seems to be contradictory with the emphasis on “nothing” as ontology of Eastern philosophy represented by Laozi. However, there actually is no essential difference between the two. According to the textual research of Pang Pu, there successively occurs three Chinese characters that are interlinked with “nothing” (无) in history: the first is “亡,” which means “to be being and then nothing” (有而后无); the second is “無” (traditional Chinese writing of “无”), meaning seemingly nothing but actually being” (似无实有), which is “not the same as nothing, but invisible and formless, which is never to be seen or touched. And that’s why it’s completely free from the conditions of space and time, existing all the time, and everywhere … Thus it is not merely nothing, but rather the great dominion of all things” (Tan 10–20). According to Pang Pu, it was not until the Late Warring States Period after Laozi that “non-being,” the third meaning of “无,” which means “nothing at all,” really appeared. Therefore, “无 (‘Tao’) in Laozi is by no means non-being, it is a kind of being, but invisible, formless, massless, and nameless, which is completely different from the being of all phenomena in terms of performance” (Chen). In essence, the ontological “nothing” is “seemingly nothing but actually being,” which is the dialectical unity of “being” and “nothing.” Therefore, Laozi on the one hand regards “Tao” as something “shadowy and indistinct” (惟恍惟惚); on the other hand, he also believes “within it is an image” and “within it is a substance” (其中有象, 象有物). “Tao” therefore “stands alone and does not change, goes round and does not weary” (独立而不改, 周行而不殆), which obviously negates the general definitive property of “invariability and immobility” in ontology, thus reaching a consensus with Hegel. Therefore, it may be said that Laozi’s so-called “being comes from nothing” (有生于无) is actually a kind of philosophical “paradox,” which aims to show that the description of the origin of all things in the universe can only be “Tao cannot be expressed” (非常道) and “name cannot be called” (非常名), rather than categorically referring to “all things come from nothing.”

In short, as Aristotle said, absolute nothing cannot have any change of motion, at least in the universe known to man at present; only change is always permanent, and stillness is always relative. So it is difficult to say that there is pure nothingness. But it is in this relative stillness that everything can be cognized and understood; metaphysics achieves universal recognition of the world by absolutizing it. On the other hand, both metaphysics and natural philosophy admit that the world can only start from some “being” or “entity,” through constant variation and evolution, so as to form a diverse universe. We
will soon witness that in the dimension of history, this concept, running through Natural Science, Life Science, and Humanities and Social Science, becomes a continuous and consistent “ontology-variant” view of variation.

2. “One two three … infinity”: change and variation in nature and natural science

There is a large overlap between natural science and philosophy on the inquiry of the ultimate question, such as the question about where all things come from. There are two schools on the origin of things: the nothingness school and the realism school. The former focuses on “from zero to one”; the latter is devoted to “from one to infinity.” The so-called “zero/nothing” and “one/being” have certain dialectical and overlapping relations. In this sense, this article follows George Gamow’s viewpoints.

According to the popular big bang theory, 13.8 billion years ago, within 10^-43 seconds of what’s known as Planck time, the singularity of the universe erupted at an unimaginably ultra-high temperature. Gravity was the first to separate, and the other three forces remained unified. There are no convincing answers in the field of serious natural science as to the question of how all these are possible, and how the clever setting of thresholds and initial conditions has produced such a wonderfully ordered universe. If pursued further, it will be disheartening for us to find that there is no less confusion about similar questions in other fields. In this case, a more rational approach would be to resort to an explanatory term that would have a uniform effect on all of these issues and that would not be so offensive to materialists and atheists. In the broadest sense, it can only be called an “invisible hand,” a term derived from Darwin’s theory of the origin of species, which is first found in Adam Smith’s economic works, and then widely used in other disciplines. For the question we are going to discuss, the existence of this “hand” is necessary because it not only sets the initial conditions for the big bang and allows all things to germinate, but also secretly regulates the evolution of everything, that is, to perform a function similar to Darwin’s “selection” so as to make the order and (relatively stable) history emerge. Just as Richard Dawkins says: “The earliest form of natural selection was simply a selection of stable forms and rejection of unstable ones” (Dawkins 13). It is in the process of “selection” to ensure a “stable mode” that the phenomenon of “variation” as its object occurs. This so-called “variation,” which is the condition for making the “selection” and “evolution” possible, means that a changing thing has acquired a certain structure or state; it can present a relatively stable special definitive property (“character”) in appearance. If change is absolute, and the entropy from the big bang is real, then the evolution (and degradation on the full cosmological scale) is bound to occur, and the “variation” behind it is inevitable as well.

In the 10^-35 seconds after the big bang, the universe cools a bit, and the strong interaction forces are separated from three other forces besides gravity. In that sense, quarks, bosons, and leptons begin to form; yet the electromagnetic force and the weak force remain in the electroweak interaction. This stage is a further step of the evolution of the universe, especially the emergence of fermions represented by leptons and quarks, which makes the history of matter particles clear. After experiencing an “inflation” process revealed by A. Guth and others, the temperature of the universe further lowers, and the so-called “particle period” begins to come. Electroweak interaction is
decomposed into electromagnetic interaction and weak interaction dominated by photons, W and Z bosons respectively. At this point, the four fundamental forces in the universe are freed; protons, neutrons, and their antiparticles are formed; neutrinos, electrons, quarks, and gluons that bound them are stabilized. Such a description is reminiscent of the famous “primeval soup” hypothesis about the origin of life, except that the latter mainly consists of compounds and organic molecules, while the “particle soup,” compounded by various particles, antiparticles, virtual particles and energy field, is not only more “primitive” but more violent. It was under such circumstances that atoms, the basis of the elements of life, are born. Of course, true emergence of neutral atoms is 300,000 years away, when the historical scroll of “matter” really unfolds. What we should pay attention to here is what kind of evolutionary process actually takes place during this period to make this scroll so orderly and brilliant. We should know that in the “primeval soup” in the early stage of the Big Bang, there might be countless, or rotational extinction, or nearly eternal particles and their structural combinations, which move at irregular speeds in energy turbulence under extreme conditions, making it difficult to piece together a recognizable and meaningful history. Moreover, according to the CP violation proposed by famous Chinese scientists Yang Zhenning and Li Zhengdao, in this process, not more electrons become anti-quarks, but more anti-electrons become quarks; in this way, after annihilating each other, they still retain about one-billionth of quarks, which constitutes the main source of visible matter in today’s universe (Hawking 102). In Darwin’s view, variation is qualitative but not directional; evolution shows a clear direction. Only evolution-oriented variation can be present in a particular history due to a certain “selection” mechanisms behind it. Perhaps the “invisible hand” plays a key role in the elimination of antiparticles in the evolution of cosmic history: at the crossroads where multiple paths have already taken place, it carries out a “heavenly duty” of directional selection to ensure that the universe moves toward a “positive history” rather than an “anti-history,” that is, an exiled universe composed of antiparticles.

Knowable history has showed that only structurally stable atoms and a few sub-atomic particles, as the deep structures, rather than antiparticles have been “selected” and become the most important chapters in their texts. As for how this history becomes recognizable and meaningful, a more reasonable hypothesis may be that, just as in the “primeval soup” of organic molecules, the incredible probability of creating a “replicator” makes life possible. In the ultra-high temperature environment of the early big bang, there are also repeated elementary particle combinations: the stable structure of subatomic particles including neutrons and protons, which are constructed by the normal bosons of carrying force and the fermions of constituting matter. This structure has laid the foundation for the emergence of more complex atomic structures, and then becomes the underlying structure of natural elements directly constructed by atoms. In essence, the formation of “particles” is a result of repetitive structure via the mutual restraint and superposition of more primitive solid particles (mainly quarks and electrons) and virtual particles (mainly gluons, photons, and gravitons), aiming at impressing the strictly screened descendants in the history. This suggests that, just as one species can be “transformed” by another, there is variability among particles, which all start with a well-defined repetitive structure.

In fact, Dawkins has revealed this from another angle: “For more than three thousand million years, DNA has been the only replicator worth talking about in the
world. But it does not necessarily hold these monopoly rights for all time,” he says, based on the phenomenon of life: “Whenever conditions arise in which a new kind of replicator can make copies of itself, the new replicators will tend to take over, and start a new kind of evolution of their own. Once this new evolution begins, it will in no necessary sense be subservient to the old” (Dawkins 193–94). On this basis, he proposes a concept of “meme” applicable to Social Science and compares it with “gene.” But further questioning where genes came from, according to the above logic, requires going back to the beginning of how everything comes into being and evolves. The repetitive structural order constructed by normal bosons and fermions lays a deep foundation for the atom and, consequently, of everything that can be known and understood. It is thus that a highly ordered intelligent being, namely, a human, can interpret (orderly and meaningful) natural history; in turn, as a stable “heredity,” the structural order evolves more complex structures through continuous “replication” and “variation,” including its direct products, namely, atoms, as well as various secondary organisms such as natural elements, molecules, compounds, life macromolecules, as well as well-ordered nucleotide substances, thus generating a vast variety of natural and living worlds.

Of course, there are huge differences among above particle variations and variations of heredity in Life Science. One of the most significant points is that it replicates itself mainly through fusion and fission after its formation. About 1 billion years after the big bang, the primitive gas, mainly composed of hydrogen and helium, gradually condenses into a nebula under the influence of gravity, and then derives into a variety of quasars, fixed stars, and galaxies with an increasingly orderly degree, among which the evolution process of fixed stars in particular can reflect the variation and evolution characteristics of particles.

When the first generation of stars enters the main sequence star, a new evolution process begins. Under enormous pressure, the hydrogen adsorbed by the stars in the early stage of the big bang would carry out a fusion reaction, which makes its core gradually occupied by helium. Continuous reaction will turn the star into a huge red giant; eventually erupting into a white dwarf and its outer planetary nebula. Stars, with a mass of about eight times than that of the sun or larger, accumulate inactive iron cores over the course of their short lives, which collapse further into neutron stars or black holes of extremely heavy per unit volume, and trigger massive supernovae explosions. According to Fred Hoyle’s theory of stellar nucleosynthesis, it is during these various continuous nuclear fusion processes that almost all the heavy elements are produced, which are then thrown into interstellar space with supernova explosions, some of which directly constitute the source of planetary matter and carbon-based life, including the Earth. The formation of heavy elements is obviously the result of the duplication, coupling, and diffusion of atoms and their deep sub-atomic particle structures, which is very similar to the working mechanism of heredity, except that the duplication process is almost error-free. That is to say, the variability of particles, especially atoms themselves, is very low. Such variability is mainly reflected in the change in number; but this change has resulted in a variety of natural elements with huge differences in structure and property.

It is noteworthy that there is a certain upper limit on the number of natural elements in the universe, and it is generally believed that there would be no more than 172 elements at most. These natural elements are arranged by nuclei and electrons in strict
numbers and rules, further forming compounds, molecules, and even life macromolecules through chemical bonds. Just as protons and neutrons with stable final structure and properties are retained in nearly infinite random binding, the formation of chemical elements and compounds obviously undergoes a “selection” process. Such “binding energy” plays a leading role, especially for these more basic natural elements; it is the “specific binding energy” with restrictive effect that defines its basic quantity. It also means that other structural patterns, such as some artificial synthetic elements with rapid decay, have been eliminated in the course of natural evolution. Only the stable structure that has been retained, where variation is mainly reflected in changes in number, can become an effective component of the natural history of the universe.

Yet why is this so? It may be that, as Paul Adrien Maurice Dirac has stated, there are always some unimaginably “large numbers” in the universe, which are such miracles and coincidences that create the universe. As a result, scientists are surprised to find that the universe contains a large number of proper natural constants. Kahn, for example, argues that if the ratio of electromagnetic force of non-hydrogen atoms to gravity conforms to the “Dirac large number,” then planets would not be able to form around their stars; even if planets formed, no atom-based life would be born (Li and Chang 3–5). Without invoking God, we can only resort to the “anthropic principle,” as Hawking does, in order to unravel this puzzle: as carbon-based observers, we can exist in the present space-time location simply because this location just provides us with the possibility of existence (Hawking 159). This principle, however, has gained considerable acceptance among scientists because it implies that all carbon-based observers are subject to a self-selecting effect, which means, “the universe must have some properties associated and compatible with it” (“On the Anthropic Principle” 341–44). If not, the universe would fall into a thorough and dehumanized mystery.

In this case, a transparent history is precisely placed against a dark background. Just as change is the only constant; only chance is the most thorough necessity. If we accept that there are variables and chance in the universe, non-directional variation is always inevitable, and there are countless baby universes that are doomed not to be recorded in history. In this case, the place where we exist, as Gottfried Wilhelm Leibniz put it, might only be “the best of all possible worlds.”

3. “Certainty in change”: variation in biology and life science

Most scientists now believe that the sun is initially formed by gravitational collapse of dust and molecular clouds with hundreds of millions of light-years in diameter floating in interstellar space, caused by disturbances from a nearby supernova explosion that occurred about 4.6 billion years ago. Thereafter, as the sun entered the main sequence star state, the nebular matter around it gradually accumulated into clusters in different orbits, eventually condensing into subsequent planetary systems.

According to Russian biochemist Opalin’s hypothesis of origin of life, 100 million years after the formation of earth, various compounds and organic macromolecules floating around the ocean form a pot of “primeval soup” in a high temperature environment, which is the earliest source of life on earth. Subsequent deep-sea exploration and paleontological studies have confirmed that there may be a seabed hot spring similar to a “black smoker” in the “primeval soup.” Due to high temperature, high pressure, and
metal catalysis, nitrogen from hot springs gradually transforms into ammonia. In addition, there is an abundance hydrogen sulfide and sulfate around it. After complex and long biochemical reactions, the amino acids that constitute the cornerstone of organic life have been produced in the late period of “Pluto” in geological history. Of course, it’s a long way from the formation of protein molecules that are folded, coiled, and structurally regular, just as Miller’s experiment is far from the synthesis of protein macromolecules.

A more distant journey lies in the formation of nucleotide substances, the only indispensable basic component of life phenomena, and precise genetic codes formed by them. According to the genetic central dogma, proteins do not contain self-replicable genetic material that belongs to the exclusive function of nucleotides, while “the origin of genetic codons is still one of the biggest mysteries of modern science” (Xie 94–106). So far, there is no relatively complete and unified view; however, this does not mean that the field is unknown. The discovery of ribozyme in 1980, for example, led researchers to believe that simpler RNA molecules, which are produced from non-living matter and serve as the dual function of DNA and protein in the future, predate DNA. Life on earth, as Walter Gilbert put it, should have started in an ancient “RNA world” before it evolves into a mass of living things. As for how long strands of RNA molecules are generated, according to Dawkins’s understanding, at some point, a “remarkable molecule” in the primeval soup accidentally forms a “replicator” – its probability is so small that it is unbelievable for people who are not accustomed to thinking at the scale of hundreds of millions of years. But in fact, it’s “not as rare as we thought it would be” and “it’s enough to happen only once.” As a further consequence, a complex macromolecular component constituted by smaller molecules stabilizes, and it happens to adhere to another affinity component; the two will automatically be arranged in the sequence of the replicators themselves, gradually forming a long stable chain, so that the layers overlap, just like the formation process of orderly crystallization (Dawkins 15). This description seems to take us back to the convergence of subatomic particles in the “particle phase” after the big bang. Both are places where surprising statistical laws and a selection mechanism come into play. The difference is that the former can generate a self-replicating genetic code; the latter can form hyperstatic structure combination – protons and neutrons. And through the energy change, more complex atoms are formed, which provides the essential material basis for the life code; at the same time, the deep structure of the code, or the password of its code, is also constructed.

Nucleotide formation is a world-breaking event in the history of life on earth. But it would take another statistical force to make the planet truly vibrant: replicators attached to it, that is, gene variation. The working mechanism of this variation form is that, under the action of various internal and external conditions, nucleotide substances in genes are disturbed or changed in terms of structure, quantity, location, combination mode, and carrier, so as to form new traits or even new species. Since genetic variation, including gene mutation, gene recombination, and chromosome variation, is ultimately the change of the gene itself, even phenotypic variation that is considered unrelated to gene structure is reflected as the change of genome modification instructions, so these variations can be essentially attributed to different manifestations of gene variation. Compared with the aforementioned particle variation, gene variation is either the mutation and recombination of genetic material or the chromosome aberration as its carrier, which always results
in a change of DNA molecule. Therefore, it is also called molecular variation, or exactly the organic macromolecular variation related to heredity. Once heredity is formed, its copy deviation is inevitable, and the blind gene variation has since laid the foundation of life. In other words, copy error is a sign of variation and a prerequisite for evolution. This is because, without error and variation, life would be confined to certain stages, resulting in no readable history. To quote the “anthropic principle,” life emerges from coincidence, evolves from error, and arrives at the correct result, that is, the readers and hecklers of the historical text of intelligent human beings evolved from it.

In 2016, the German scientist William Martin pointed out that 355 conserved genes in the DNA sequence of life on earth are widely distributed in all major life classes; in general, these genes should also exist in the body of the last universal common ancestor, LUCA; and because these genes have extremely important biological function, thus they can span nearly 4 billion years of time and remain today (What is Life 55). LUCA, the oldest supposed creature, is a common ancestor of life on earth, just as Lucy, the australopithecus that lived about 3.2 million years ago, is thought to be the common ancestor of humans. DNA sequences in LUCA evolve continuously to prokaryotes, cyanobacteria, archaea, dinoflagellates, Ediacaran biota, Burgess fauna, Ichthyostega, dinosaurs, mammals and primates through gene variation as well as severe natural catastrophe and survival competition. These DNA sequences then migrate through Lucy and early Homo sapiens several times from the East African Great Rift Valley until the late Homo sapiens, a direct ancestor of mankind, successfully emerge from Africa and sow seeds of race and civilization on other continents, thus shaping the surface ecosystem as it is today.

This is the usual textbook account of the evolution of life, which is obviously too simplistic and idealized for life scientists, and which fails to shed much light on the underlying dynamics of evolution, if it exists at all. For these questions, many researchers tend to resort to biochemical physics, known as the “life entropy” theory. This theory also involves another fundamental aspect of the general concept of “life,” called “metabolism,” which is also another aspect of gene variation.

According to Schrödinger, a famous quantum physicist who first put forward this theory and, “Thus a living organism continually increases its entropy – or, as you may say, produces positive entropy – and thus tends to approach the dangerous state of maximum entropy, which is death. It can only keep aloof from it, i.e. alive, by continually drawing from its environment negative entropy … what an organism feeds upon is negative entropy. Or, to put it less paradoxically, the essential thing in metabolism is that the organism succeeds in freeing itself from all the entropy it cannot help producing while alive” (Schrödinger 71). The second law of thermodynamics is one of the most irresistible basic laws in the whole universe, which is also Einstein’s insight; however, in Schrodinger’s view, the phenomenon of life acquires its own definitive property in the process of resisting an increase of the entropy of the universe. These widely circulated statements contain at least two important levels of information:

Macroscopically, the metabolic process in which life absorbs nutrients and eliminates waste is essentially a process of absorbing highly ordered low-entropy macromolecules, such as protein and starch, and then excreting relatively disordered high-entropy small molecules after digestion and decomposition. In this way, the process of obtaining
negative entropic flow for living organisms will result in a coordinated and orderly stable state, that is, a non-thermodynamic equilibrium state.

On the microscopic level, as Schrödinger says, “An organism’s astonishing gift of concentrating a ‘stream of order’ on itself and thus escaping the decay into atomic chaos – of ‘drinking orderliness’ from a suitable environment – seems to be connected with the presence of the ‘aperiodic solids,’ the chromosome molecules, which doubtless represent the highest degree of well-ordered atomic association we know of – much higher than the ordinary periodic crystal – in virtue of the individual role every atom and every radical is playing here” (77). This remark is thought to be an astonishing prediction of the existence of DNA, a genetic material on chromosomes. Only ten years later, Watson and Crick completed the discovery. Schrodinger has explored the underlying reason why living organisms can absorb the negative entropy flow, that is, the fundamental heterogeneous isomorphism of some “known atomic aggregate with the highest degree of order” far beyond the periodic crystal order, which is similar to the understanding of the ordered universe revealed by the above-mentioned “anthropic principle,” showing once again that natural, life, and spiritual phenomena have inherent continuity and unity. However, Schrodinger does not go further into how this highly ordered genetic material itself is formed; it is not until Belgian physicochemist Prigogine put forward the dissipative structure theory that a more credible theoretical proof has been obtained. According to Prigogine, a non-linear open system far from a state of equilibrium may cause its spontaneous symmetry breaking or nonequilibrium phase transition when its internal parameters change to a certain threshold by exchanging matter and energy with the outside world and the fluctuation effect caused by such exchanging, thus turning the chaotic disorder state of the system into ordered state of space-time and/or function. Biologically, adenosine triphosphate (ATP), known as the “energy currency” of living organisms, may provide the earliest energy source, allowing organic molecular aggregates in disorder to be ordered gradually through the process of “fluctuation” and “mutation” in the sense of Prigogine; thus, amino acid and nucleotide components can develop orderly protein molecules and DNA double helix structures, respectively.

Now the question is, after the formation of the genetic code sequence, how will the indelible entropy change affect the gene variation in the microcosm? According to the general understanding of biotic variation, prior to the emergence of sexual reproduction and in conventional genetic and chromosomal mutations, the main cause of natural variation is the disturbance of radiation, temperature, and other changes to the inherent base order or its carrier. In this way, variation phenomena such as base substitution and frame shift mutation occur at fragile parts of DNA. These factors are essentially the reflections of energy fluctuation or entropy change, which is Schrödinger’s understanding of gene variation, namely “quantum jumps” (Schrödinger 48) of gene molecule. Thus it can be seen that the so-called biological variation can be traced back to the irreversible entropy increase process of the universe; the latter means the decay or degradation of all ordered structures, as opposed to the evolution of life phenomena from low to high, from simple to complex. Fortunately, under certain conditions, chaotic and disordered open systems can always “evolve” to some degree of ordered structure, including the aforementioned structural aggregation of elementary particles to neutrons, protons, and atoms, among which, the ordering degree of atoms even led Rutherford to put forward the “solar system model.”
However, as life on earth evolves into modern Homo sapiens, blind, random, and undirected variation based on entropy begins to usher in an unprecedented reversal: directed variation by artificial induction steps onto a historical stage. Directed variation is based on a high development of molecular genetics and genetic technology, which reduces the inherent randomness of natural variation and most adverse consequences to a controllable range, and, to a large extent, replaces the “invisible hand” of natural selection by artificial selection. Gene-editing, which is causing a global moral panic, is a typical expression of artificial variation. Such “synthetic elements” technologies, similar to those used in physics and chemistry, are now able to “edit” any gene in living cells efficiently and easily. And there are even suspicious signs of large-scale modification of human genes. Gene-editing, cloning and transgenic technologies that are still controversial today can acquire human-designated heritable traits by altering genes. From the perspective of natural philosophy, these practices are essentially the process of defining the blind flow of nature by some fixed numbers or rules, or introducing specific negative entropy flow into the chaotic system, in order to form a structural order conforming to human will. If we admit that “only change does not change,” then all kinds of genetic technologies tend to “pursue certainty in change” through taming the chance by the inevitability, or to ask for order and information from the blindly chaotic nature of the universe.

In this sense, the aforementioned less convincing anthropic principle hypothesis in the field of particle variation has been thoroughly remolded because directed variation means that the “weak anthropic principle” has to give way to the “strong anthropic principle” within the scope of engineering available to intelligent human beings. Moreover, the philosophical basis of this principle is no longer Copernicus, but what Kant calls the “Copernicus Revolution,” which emphasizes that reason is not “taught by nature,” but “reason asks nature questions and asks for answers.” Although the strong anthropic principle here may be far less effective than the weak anthropic principle (involving the whole universe), it is generally valid at least in the sphere of life on earth.

As far as Life Science is concerned, such ideas exist not only in genetically modified humans, human cloning, and cyborgs, but also in the process of the transformation of living organisms by non-hereditary MoistMedia and wearable technology. Furthermore, based on the computer code system, which can be regarded as the virtual counterpart of the DNA coding system, all kinds of electronic monsters, cybers, IP, and quadratic elements created by them have formed a brand new variant world through the powerful “anthropic principle.” This world is no longer subject to the natural environment; but it is introduced into a completely heterogeneous virtual space-time field, which, in turn, causes more and more profound intervention and influence on the physical world. In the field of artificial intelligence, ever-growing computer codes, as described in sci-fi works, may one day make copy errors similar to gene variation, which will lead to self-evolution and even become super-variants of human beings. If so, and if human technology fails to enforce the law of automatic sterilization after generations like Von Neumann Robot, then artificial intelligence based on the anthropic principle will eventually become an ultimate mourner of this principle.
4. “Changes last”: variation in culture, and social and human sciences

Both Schrodinger and Prigogine are inclined to believe that nature and living organisms share a common set of laws to a large extent. Biosociological theory put forward by life scientists represented by Edward O. Wilson argues that there is also an undeniable internal continuity between life phenomena and human society. However, this does not mean that the three have absolute self-identity in a philosophical sense; on the contrary, their continuous relationship is based on their own special definitive property. For the “variation” issue, the “initial fixed point” or “gene” types of each of the three reflects the unity of such particularity and continuity.

According to Dawkins’s explanation, there exists a kind of similar biological “gene” counterpart in the field of social culture, which is called “meme,” deriving from the Latin word “mimeme.” In order to make it more like the word “gene,” Dawkins transforms it into “meme,” which also makes it relevant to the words “memory” in English and “Méme” in French; moreover, meme also originates in some type of “primeval soup” (Dawkins 192). Meme variation is a sort of variation, which is both intrinsically related to and different from particle variation and gene variation.

Dawkins emphasizes many times that DNA is not the only replicator in the universe with a monopoly, and genetic evolution is only one of many possible kinds of evolution as Dawkins states; other structures can also function as genetic codons. Of course, in the field of social culture, DNA molecules and the genetic genes attached to them provide irreplaceable basic value: “The old gene-selected evolution, by making brains, provided the soup in which the first memes arose” (194). Dawkins does not elaborate exactly how this “new soup” resembles the “primeval soup” of life; but as far as the generating environment, namely, the brain, it suggests that it may be similar to the age-old “self-consciousness” of late Homo sapiens. Psychologically and philosophically, “self-consciousness” refers to the subject’s perception and judgment of self-experience. Since this cognitive judgment involves others and the relevant environment, it is generally believed that self-consciousness is the basis of all intellectual actions; since any knowledge means order and information, nature, life, and spirit are integrated.

The further question is, in the “primeval soup” of self-consciousness, how does meme combine into a long-chain structure like DNA molecules, thereby influencing certain heritable “epigenetic traits”? Dawkins does not answer this question, but he believes that there is a kind of “mutually adaptive, stable, and mutually reinforcing meme complex” similar to the genome. The reason for this formation is that it helps to improve the meme’s survival value and thus more effectively to improve natural selection of its environment. “God meme,” for example, in order to consolidate its survival advantage, must be accompanied by the opposite punitive concept in the sense of content, namely, “hellfire meme,” which comes from a deep fear of human instinct. When “hellfire meme” is associated with “god meme,” they can complement each other and promote each other’s survival in the meme pool. At the same time, they can also be further associated with “the meme that drives people to believe blindly,” forming a more complicated meme complex. This understanding is apparently closer to more complex social and cultural phenomena in terms of the structural law.

According to Dawkins, meme covers a wide range of subjects, including “tunes, ideas, catch-phrases, clothes fashion, ways of making pots or of building arcades” (192). In this
case, as long as it conforms to the concept “as a cultural dissemination unit or imitation unit,” it can be meme or its structural complex; however, this does not mean that all social and cultural beings are the result of meme (but to be precisely, a large majority is the result of meme variation). According to Dawkins, real meme must possess three abilities: longevity, fecundity, and precise reproduction. The first two give meme a historical dimension, and the latter guarantees its vitality. These three abilities can make meme flourish in human history. Some memes can even inhibit human behavior as a “survival machine” of genes in order to “prolong life,” thus subordinating the life instinct to the cultural mission. This is the reason why the phenomenon of “giving up life and taking justice” appears repeatedly in history. In this sense, Susan Blackmore claims that the essence of human beings is a complex of genes and meme, and also a “survival machine” shared by both (Wu 20). If this point of view is refined, it can be said that the two essential elements are deeply based on the basic particles and their variants.

The issue is that meme’s ability to “accurately reproduce” is easily confusing: “The difference between high-fidelity genes and low-fidelity memesis assumed to follow from the fact that genes, but not memes, are digital” (Blackmore x). Because the process of transmission must be carried by the free-will human brain, it has to mix up some subjective consciousness; so a weak error rate similar to gene replication is almost impossible in meme replication. Dawkins believes that the latter may be of a magnitude higher than the former. From this point of view, from particle variation, gene variation, and then to meme variation, variability (error rate) is increasing, and the apparent types of variants are becoming more and more abundant.

From the point of view of genetics, the reason for the greater variability of meme is closely related to its “granularity” characteristics in the process of replication. The concept of “granularity” as opposed to “fusion” was first proposed by Gregor Johann Mendel, a renowned geneticist and priest, who believed that the working mechanism of genetic units followed the principle of free combination and independent separation, rather than developing some “middle” or “transition” traits through simple superposition or heterozygosity. If the latter situation exists, after several generations, within a species, “the individual differences between groups will become smaller and smaller, and eventually tend to be homogeneous; in this way, there will be no variation, and natural selection will become a rice-free cooking” (Shu). This principle has the same explanatory effect on the field of social culture: the reason why this field has not been unified so far but tends to be pluralistic and diversified is that meme duplication and variation abandon the principle of integrated heredity but follow the principle of granularity. It, in turn, shows that the so-called “incommensurability” or “heterogeneity” phenomena, like the great differences between Eastern and Western civilizations, proposed in disciplines such as cross-cultural studies, cultural anthropology, and comparative literature, are based on meme’s principle of particulate inheritance to grow, develop, and sustain for a long time.

The complexity of human civilization is essentially based on meme’s replication and variation as well as a result after experiencing some “selection” and “evolution.” But as Runciman puts it, “The process of cultural and social variation, to a great extent, is guided by self-consciousness, which is different from gene variation” (Runciman 177). In other words, meme variation has undergone tremendous changes in the aspect of the subject of selection and mechanism, and it begins to be subject to the dominance of “self-consciousness.” For example, as for the emergence of two different kinds of memes,
namely, “democracy and autocracy,” “natural selection” may only play a very limited role (maybe more at the beginning of civilization), while the aforementioned “strong anthropic principle” with limited scope of influence has a great effect, which ensures that the vigorous meme variant can obtain more favorable survival prospects. This principle plays an important role in human society, weakening, to a large extent, the social Darwinism that is criticized and difficult to eliminate within the scope of sociobiology. The alleged social Darwinism emphasizes “the jungle preys, and the survival of the fittest”; and the strong anthropic principle means that social competition is subject to the normative guidance of intelligent design, so it is rational, limited, and moral. Perhaps it is this point that leads to the emergence of an ethical system and welfare society.

If it is admitted that it is meme variation and its evolutionary process that shape human civilization, then, in turn, the structure of any civilization can also be traced back or restored to a specific space-structure or time-base point. In other words, some primitive elements in a particular space-time are the prototypes of meme variation.

In this sense, meme variation can be divided into two types macroscopically: one is “structural” variation based on spatial and formal dimensions, and the other is “initial” variation based on time and content dimensions. For the former, the changes of some structures, codes, images, ways, configurations, rules, paradigms, and so on, which have occurred repeatedly in the history of civilization, are all typical representatives of this type. Thomas Kuhn, for example, argues in his book The Structure of the Scientific Revolution that after the formation of the original theory or school, science has entered a conventional stage of development, during which the “scientific community” gradually emerges, and its members share the same set of thinking patterns, codes of conduct, and belief systems, thus forming a “paradigm.” The existence of a specific “paradigm” can regulate scientific activities; but, at the same time, it sets various restrictions. When these restrictions have to be challenged with the emergence of new questions and discoveries, a new paradigm emerges. The whole history of science follows the principle of paradigm changes, evolving from low to high, from simple to complex. Kuhn’s so-called “paradigm revolution” is undoubtedly a portrayal of the structural meme variation. Similarly, Hegel proposes the symbolic, classical, and romantic art typology, which is also a typical manifestation of this type of meme variation. In addition, the division and evolution of Michel Foucault’s four “knowledge types” and the historical changes of Marx’s five modes of production – all these are the manifestations of a structural meme variation, which leads to the construction of a more complex structural system.

The “initial” meme variation with time and content as the basic dimension is mainly embodied in the process of absorbing other meme elements and expanding itself from the specific starting points of theory, information, element, language, theorem, law, and postulate, so as to form a more complex content system. Euclid’s geometry is a typical representative, which deduces 465 propositions from five axioms and five postulates, showing an amazing extensibility of the initial meme variation. Descartes’s philosophical system constructs the whole knowledge system from the undoubted “I think,” which is also a typical manifestation of this type of meme variation. In addition, Plato’s eidos, Hegel’s absolute spirit, Einstein’s mass-energy equivalence and field equations, as well as the foregoing changes or operations of computer source code that can develop into strong artificial intelligence, can all be attributed to this type of meme variation. It is not
difficult to notice that the initial meme variation constitutes a deep evolutionary foundation of science, thought, and concept phenomena.

To sum up, meme variation is very important for the development, evolution, and diversification of human civilization; therefore, in the field of the Humanities and Social Sciences, this issue has aroused widespread concern and discussion. Susan Blackmore, the female disciple of Dawkins, first expounds the idea of Dawkins and puts forward a systematic “theory of meme.” She claims that this theory “gives rise to explanations for such diverse phenomena as the evolution of enormous human brain, the origins of language, our tendency to talk and think too much, human altruism, and the evolution of the Internet” (Blackmore 9). American scholar Limor Shifman has applied and developed the theory of meme in the field of communication. In his popular book *Meme*, he focuses on network meme and cyber culture phenomena, and makes a comparative analysis of the characteristics of the transmission of meme and its relationship with virus transmission (Shifman). In addition, social linguists, represented by William Labov, put forward the systematic theory of “language variation” in the 1960s. They hold that language is a process existence of “heterogeneous order” which is constantly changing and evolving, rather than a static, isolated, and homogeneous structural system, because of the wide and profound variation of language since its birth due to the changes of social culture (Chambers).

In the field of comparative literature and cross-cultural studies, Chinese scholar Cao Shunqing has put forward a systematic idea of “variation theory” in the fields of comparative literature and cross-cultural studies. In the book *The Variation Theory of Comparative Literature*, he has systematically discussed the transplantation, travel, change, localization, domestic appropriation, cross-cultural acceptance, adaptability, and rejection of literature and culture, especially based on the issue of heterogeneity and comparability, which enriches and develops the disciplinary theory and philosophical basis of comparative literature and culture (Cao). Although these studies are not necessarily devoted to inheritable meme variation, they have exerted a wide influence in the current Humanities and Social Sciences, thus becoming a promising academic point for development.

5. Toward “general variation theory”

Based on the above clues of change and variation, this article has systematically explored relevant phenomena and theories in nature, life, and culture. Variation exists universally in various disciplines with certain internal unity embedded, which can at least be regarded as one of Planck’s “continuity chains,” running through various independent disciplines, including philosophy. Through such a grand perspective of clarification, the idea of “variation” derived from Life Science has been promoted to the level of generalization, which can be called “general variation theory.” This new theoretical concept indicates that Natural Science, Life Science, and culture (humanities and society) science have some inclusive, accommodating, and identical relations in the aspects of origin, variation, innovation, reproduction, and dissemination, thus they can be explained with a unified idea. However, this does not mean that these disciplines with distinct boundaries in the traditional sense would lose their own special definitive property, but that they own an internal basis of unified explanation. Accordingly, the above-mentioned general variation theory, which aims at Philosophy, Natural Science, Life Science, and
Humanities and Social Sciences, can be divided into four major fields in terms of knowledge: basic variation, natural variation, biological variation, and cultural variation. As independent structural plates, they all have special phenomena, questions, and knowledge models belonging to this field, yet a unified concept of variability runs through them, thus producing a universal interpretative effect. If we recognize that the universe is continuous and everything is knowable in a relative sense, then the future-oriented “general variation theory” is a promising concept.

Notes

1. Aristotle defines “entity” in Categories as “something neither narrating a subject nor depending on a subject.” Variation does not have such characteristics; it is just the opposite.
2. Feng Youlan believes that “those studies about the ontology of ‘being’ and the elements of ‘reality’ are so-called ‘ontology’; those about the occurrence of the world and its historical destination are so-called ‘cosmology.’” (See Feng Youlan, History of Chinese Philosophy, Volume 1, Beijing: Zhonghua Bookstore, 1961, p. 3.) Here ontology belongs to the category of metaphysics, while cosmology belongs to natural philosophy. The two views on the origin of the world are different.
3. Similar negative descriptions are often used in Life Science to express the origin of life, i.e. genetic material. For example, Richard Dawkins refers to DNA macromolecules as immortal “double helix” (See Richard Dawkins, The Selfish Gene, Oxford and New York: Oxford University Press, 1989, p. 22.), and also holds that life is only the survival tool of genes, and that only genes, not life itself, can really proliferate. Compared with the life of birth and death, the so-called “immortality” of Dawkins is very metaphysical.
4. “One Two Three…Infinity” is also the name of one of George Gamow’s popular science books. (See George Gamow, One Two Three…Infinity: Facts and Speculations of Science, Dover Publications, 1988.)
5. Dawkins mainly explores the formation of long strands of DNA at this point. And more primitive and simpler RNA should be similar.
6. This process may happen in some of the so-called “lost cities” of the “primeval soup” mentioned above, where a certain amount of hydrogen ion concentration difference is formed between the alkaline hot springs erupted by the “black smoker” and the acidic seawater. According to Peter Mitchell, it resembles the “chemiosmosis” of hydropower stations. It is this difference that produces ATP and further makes life on earth “assemble proteins and DNA molecules with such energy to build stronger dams to store hydrogen ions,” thus it can still thrive far from this hotbed of life (Wang Liming, What is life, Beijing: Posts& Telecom Press, 2018, pp. 54–58). The Chinese biologist Xie Ping also puts forward “ATP center hypothesis” as the origin of life. He believes that it is the transformation and condensation of ATP itself that results in the informatization of life processes, namely, the generation of DNA triplet coding system, and the self-assembly of protein components. (See Xie Ping, “The Origin of Genetic Codes: from Energy Transformation to Informatization,” Biodiversity Science, No. 1, 2017).
7. Of course, this is not to say that “natural selection” in Darwin’s sense cannot play a role, but that the role of the anthropic principle has increased. Therefore, we cannot agree with Nick Ross’s so-called “selectionism of egocentricity,” or rather, that the choice pattern of human society is the result of the interaction of the two; after all, it cannot be denied that man is unique in Nature. In this sense, it is questionable that Susan Blackmore believes that human civilization is entirely subject to natural selection.

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