

The Logic of Mutual Correlation

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This thesis seeks to give expression to the logic of the material world, the life world and the human society by offering specific examples of each case, utilizing the logic of the unity and plurality, the part and the whole, and the field and the individual.

Concurrently, it will reflect back on the philosophies of the East and the West, including those of Georg W. F. Hegel, Gottfried W. Leibnitz, Alfred N. Whitehead and Kitaro Nishida.

1. Unity and Plurality

Contemplating the Global Ecosystem

In the global ecosystem, for example, each life form such as vegetations, animals and microorganisms are mutually correlated with each other in the establishment of an ecosystem. Moreover, each part of an ecosystem is constantly in motion, the rhythm of which spreads to the entire ecosystem and brings constant changes to it. An ecosystem reacts sensitively to changes originating in both exterior and interior, adjusting itself to them. The global ecosystem also consists of an infinite numbers of events interacting with each other, creating the world of mutual correlation in which no single event can be separated from others, making it a world with a complex system.

In this ecosystem, various substances such as water, carbon, nitrogen and nutritive salts circulates through countless life forms, and through this material circulation energy from the sun and the earth interior flow through each life form. Thus, from the primitive bacteria to protists, vegetation, animals and humans are all in continuity maintained by the material circulation and the flow of energy. The components of the global ecosystem, so to speak, carry the same life and are connected by the same life.

Inorganics, microbes, vegetation, animals and humans are not isolated existences, but is a continuous existence. Humans also are connected to other animals and plants, as well as all other things such as the soil, water, fire and wind. All things are both irreplaceable individuals exhibiting their characteristics and one existence correlated with each other at the same time.

Real existence shows its plurality through individual characteristics, and at the same time it shows unity through the connections and interaction between each other. They are plural while being one, and are one while plural. It is the plural unity and single plurality. The one in the many and the many in one; that is the principle of the reality. The total unity and individual plurality are inseparable. All things are full of diversity and variations, yet at the same time are united as one. Existence is the unity in the diversity and at the same time the diversity in the unity.

Moreover, in the global ecosystem, each of composing elements interacts with each other, forming a fluid realm. In such environment, a change in one component will deeply affect many of other components both directly and indirectly. The realm of an ecosystem is where interactions between its components take place freely. Each life form closely interacts with and reflects on other life forms in order to constitute an ecosystem.

In brief, an individual unity reflects on a total plurality, and the total plurality on an individual unity. In this context also, one is the many and the many is one. The plurality is within the unity, and the unity within the plurality. Even a dew on the tip of a leaf of a lily reflects the entire mountain, rivers, grass and trees, as well as countless other things including the sun, the moon and all the stars. And at the same time, mountains, rivers, grass and trees, as well as countless other things including the sun, the moon and all the stars reflect the single dew.

Leibnitz and Whitehead

The monadology advocated by Leibnitz is also based on the logic of one in the many and the many in one. Leibnitz found reality in monad, which is a heterogeneous individual mutually distinguished. However, many of these monads are mutually interacting, corresponding and sympathizing. Therefore, attention concentrated on a single monad will concurrently spread throughout the entire universe. Each monad possesses sufficient basis for its existence, but the basis originates in the continuity of things and events that are on a mutual foundation. While the unity appears as the plurality, the plurals are again correlated with each other, eventually unified into one¹. The realm described by monadology is also where one and the many, the total unity and the individual plurality are inseparable.

Furthermore, Leibnitz finds the real nature of a monad in an “idea”. He explains that the

difference in each monad is in the extent of their representational functions. Thus, each monad, depending on their extent, represents all the other monads, and at the same time expresses the entire universe. Though monads do not possess a window through which certain things can traffic in and out, in terms of their representing all things, all could be windows as well. A monad projects within itself and expresses the entire universe. The representational function of monad reflects and expresses the many in one. It includes the many and expresses within one. The representational function is nothing but the many within one². That is to say, in this case, the total plurality is expressed in the individual unity.

The universe possesses countless expressive points within itself and innumerable centers all over. Such universe has no center anywhere within, and at the same time any point of it can be the center. The realm described by monadology is the realm of the mutual integration and interaction between one and the many, total unity and individual plurality, and individual unity and total plurality – that is to say, it is a world of complex system.

Whitehead also mentioned in his writing titled *Process and Reality* about what would be “monad” in Leibnitz’s works, and referred to it as “actual entity.” Moreover, similarly to the representational function of a monad, Whitehead considered that the actual entities mutually contain each other. Therefore, the self-formation of an actual entity utilizes the participation of all things in the universe as its intermediation. Similar to monad, actual entity is in a sense a function that unifies the many into one. All things and events in the real world occur while mutually containing each other³. The view of Whitehead emphasizes on an aspect of the individual unity, which autoplasm while containing the total plurality. In that sense, Whitehead also is explaining the mutual integration and interaction between one and the many.

The All is One, The One is All

Kegon philosophy also advocates the idea of “*Issoku-issai* (the one is in all and the all is in one), exhaustively explaining the mutual dissolving of the individual unity and the total plurality. Kegon philosophy also considers the world is established on the mutual connection, reflection and containing between all things and events. Therefore, when focusing on the occurrence of one event, all the other events will be contained within the occurrence itself. Conversely, the occurrence of one event is also contained within the occurrences of all the other events. All things and events consist of all the other

things and events. Kegon philosophy explains this with the logic they call “*Issoku-issai*” or “*Issai-sokuichi*”. “*Issai* (all things)” is in “*ichi* (one thing)”, and one thing in all things. All things enter inside one and one inside all things. All things take in one and one takes in all things. Thus, Kegon philosophy explains the mutual integration and interaction between the one and all things, as well as the obstacle-free relation of the two.

In the realm described by Kegon philosophy, each existence contains all things, and within all things each one exists. They refer to it as the world of “*Jiji-muge* (no obstacles between things)”, which is a world of complex system. In fact, Fazang, the Chinese monk who had completed the philosophy of Kegon, extends further into the details of this philosophy of “*Issoku-issai*” and “*Issai-sokuichi*” in *Five Chapters of Kegon* (華嚴五教章), with his tenacious ability to contemplate. This world view of the Kegon school is a magnificent system that explains the logic from both the mutual integration and mutual interaction, and from both the spatial and time aspects. Moreover, the logic is also explained with the metaphor of ten mirrors reflecting each other. When a Buddha statue is placed in a room with mirrors on the walls of eight directions as well as on the ceiling and the floor, the image of the statue will be reflected on all mirrors, and each reflected image will be reflected infinitely, overlapping with each other. This metaphor describes the world of “*Jiji-muge*”, where all things are infinitely overlapping with each other, mutually integrating and interacting. In there, all things are reflected in one, and one in all things. Fazang utilized such virtuosic metaphor to explain the mutual integration between the individual unity and the total plurality⁴.

While Fazang’s philosophy is based on the interpretation of *Kegon-kyo* (Avatamsaka Sutra), which is included in Mahayana sutras, *Kegon-kyo* describes what Fazang had explained with the logic of *Issoku-issai* and *Issai-sokuichi* with metaphors of pores and dust particles. According to it, in a single pore on the skin of Fugen Bosatsu, the entire Buddha land fits in, and from each pore, pieces of cloud equal to the number of dust particles in the entire Buddha land will be discharged. It also says that in a single particle of dust the entire Buddhist teachings could fit in, and in all Buddhist teachings a single dust particle is contained. Thus, *Kegon-kyo* repeatedly describes how all things are unfettered and flexible, the whole world being reflected in a particle of dust and a particle of dust in the whole world⁵.

Kegon- gyo also explains the world view of *Issoku-issai* and *Issai-sokuichi* using the metaphor of a grand palace. It depicts a magnificent grand palace adorned with innumerable jewels that holds thousands and thousands of palaces inside that do not infringe on each other. In each and every palace, a Bosatsu is practicing asceticism. Entering one palace would mean entering all palaces, and entering all palaces is equal to entering one. In here, one land and all lands, one teaching and all teachings, one moment and all moments, and one eternity and all eternities are considered to be in mutual integration and interaction. The grand palace is the metaphor of the structure of our universe, in which the individual unity and the total plurality are mutually integrating⁶.

Another metaphor also used to explain this world view in *Kegon- gyo* is the Indra's net. The net in the palace of Indra is dignified with numerous gems. All gems are reflected on the surface of one gem, while the one gem is reflected on the surface of all gems. Moreover, within the reflected gem, all the other gems are reflected. Gems reflect each other, forming infinite layers of network⁷. The metaphor of this Indra network also explains the logic of *Issoku-issai* and *Issai-sokuichi* or that of the mutual integration and interaction between the individual unity and the total plurality.

The Network Structure of the World

From the micro material world to the macro world of the outer space, our world is composed of the network structure of innumerable factors mutually interacting with each other. The world is the network of the relations between factors, linking in all directions, interacting and infiltrating mutually. All existences in it are not capable of existing independently but are in total Correlation. Therefore, in the existence of one thing, all things take part. The self and the others are inseparable. In here, all factors exchange information with each other, and through the network of information, a change in one factor will affect all other factors. It also leads to the change in the entire structure of the network. In addition, the change in the entire structure will affect the factor, bringing changes to the factor itself. Our world is a dynamic network that forms itself from the recursive circular structure: that is to say, it is a complex system.

In fact, in the micro material world, particles constantly interact with each other in the incessantly changing field, forming a close network. The dynamic network society of events, in which along with the changes in particles the field changes, and with the changes in the field the particles change: that is the micro material world.

The world of lives, which is superordinate to that of material, also is a complex system composed of the network of each factor. Events such as the breeding and evolution generated by the interaction of genes are also impossible to understand ignoring the network between genes. Systems in a human body, such as the circulatory, immune, neural or endocrine also take the form of network structure composed of interactions between each factor. Taking the immune system for example, it is composed of a network structure between immune cells closely connected through information mediators. Through such network, immune system recognizes the self, responds to the changes in the environment impromptu, and maintains the survival of the human body. Neural network also is composed of a closely tied neuron network, and what is more, it forms a multilayered network with other systems such as immune and endocrine.

Human society is also a network society that consists of mutual relations and interactions between each individual and is a complex system. Human society is composed of interactions conducted among the network of relations between each individual. All social activities of humans, including communication, technology, economy, politics, education and religion, are composed of such network between each individual. It also forms the union, integration and changes of the society. Not only that, the global ecosystem and the universe itself are composed of the network between innumerable factors.

This world is a complex system that forms itself through the mutual Correlation between innumerable factors. Its logical structure is in the mutual integration and interaction between one and the many, that is to say, the mutual integration and interaction between the individual unity and the total plurality, and between the total unity and individual plurality. The structure of Indra network depicted in *Kegon-kyo* describes symbolically the network structure of such world.

The Mandala of Esoteric Buddhism also symbolically expresses the network structure of the world that consists of the mutual integration between one and the many, that is, between the total unity and the individual plurality, or between the individual unity and the total plurality, against the backdrop of the world view of the Kegon school. Innumerable variety of buddhas that consist the Mandala are the expression of the cosmic life, and while each of them exhibit their characteristics, they are mutually connected and are one. That is to say, one is the many and the many is one. The total

unity and the individual plurality mutually integrate. Concurrently, each of various buddhas composes the world without obstacles while reflecting each other and as the representations of the cosmic life. In other words, the mutual integration between the individual unity and the total plurality is valid in there. The Mandala is the miniature of the entire universe composed of the mutual integration between one and the many.

One As Many

Kitaro Nishida was the one who had persistently investigated the logical structure of the world where one and the many mutually integrated. Nishida respected Leibnitz's monadology and took special notice of the expressive function of monad. The expression is to reflect the many on one, and by doing so monad can both reflect the world and become one of the viewpoints for the perspective of the world. From that viewpoint, the world is composed and created within the world. In this case, Leibnitz had defined "representation" as the expression of the many as one. However, Nishida did not limit it to just representation but comprehended as something more behavioral. In Nishida's comprehension, monad as a viewpoint of the world is something more creative and formative⁸.

Nishida referred to this creative world as historical world, and considered that the historical world is consistently formed by contradictive self-identity between one and the many. The behavior and formation in the historical world can also be understood by the principle of the contradictive self-identity between one and the many.

Nishida finds such historical world especially in the human world. On the contrary, Nishida assumes that such historical world as the contradictive self-identity between one and the many is not fully exhibiting its essence in worlds of life and materials. According to Nishida, the material world is the world of "one of the many" or "from the many to one", as seen in events such as chemical bonding, whereas the life world is that of "the many of one" or "from one to the many", as seen in events such as the cell division of an embryo. In contrast, finally in the human world, "one of the many" and "the many of one", and "from the many to one" and "from one to the many" can concurrently exist. In other words, Nishida considers that the world of one as the many and the many as one appears in the truly historical world. The historical world is the world of the contradictive self-identity between the individual many and the total unity, Nishida states⁹.

Of course, it is questionable whether it is acceptable to simplify the logical structures of the worlds of material, life and historical as Nishida did. As seen in the example of the global ecosystem, both the material and life worlds are originally the worlds formed through the mutual integration and interaction between the total unity and the individual plurality, and between the individual unity and the total plurality, and must be considered as the historical world on their own. Human historical world is not the first place where one as the many and the many as one become valid. The material world, life world, human world and the universe itself are consistently historical and self-formative world.

Moreover, Nishida's terminology on one and the many shows many signs of confusion, and his narration is extremely vague and ambiguous. "One" is used as "total unity" in some cases and "individual unity" in others. Accordingly, the word "the many" is also used in vague fashion. However, if we were to overlook such problems, Nishida's logic of the contradictive self-identity between one and the many can be appreciated as the well-made effort to logically express the structure of the complex system that forms the self from mutual Correlation.

From the material world, life world, human society, global ecosystem to the universe, the world is a self-formative mutual Correlation, in which each factor relates and reflects each other, and is a complex system. Moreover, its logical structure, in all phases, is composed of the mutual integration and interaction between one and the many, that is between the total unity and the individual plurality, between the individual unity and the total plurality. The world, so to speak, is a fractal structure, which can be expressed by the same logic of the mutual integration and interaction between one and the many.

2. The Whole and the Part

From Material World to Space

According to what the contemporary physics elucidates, particles are mutually correlated with each other, composing the inseparable whole despite their being apart. The close connection between all particles is the truth of reality. Even if a particle seemed to be acting independently, in truth it is merely a specific form the inseparable whole takes. Components of a material shall be comprehended as a part of the united whole and not as an independent substance. In the material world also, it is difficult to

separate part from the whole, or the whole from part. Therefore, reducing a material into its ultimate components in search for its origin would be very little help in understanding the basic principle of materials. Where part is closely connected to the whole, the whole will be contained within the part, which makes it impossible to understand the whole by simply dividing the whole into parts. Likewise, simply superimposing parts together as if to assemble them will not help understanding the whole.

The same is true in the life world, which is at a higher level than the material world. Both in the cases of a multicellular organism composed of symbiotic unicellular organisms and of a human body operated by cooperation of many organs, the whole is always more than the total sum of parts. In such cases, each part working as a part of an organically organized whole exhibits a new characteristic that was not seen as an individual part. Judging from this point of view, it is impossible for the whole to exist without part, and part without the whole. Life is the unifying power that organizes the whole through bonding parts, and if this unifying power was to be lost, organs and cells that composed that power will lose their meanings. Moreover, when focused on the creation of each organ through the cell division of a single fertilized egg, it is evident that the whole precedes part. It begins with the whole, then it is divided into parts, each of which takes responsibility for a specific function to establish a life form.

Conversely, it is also true in this context that the whole exists within part. For example, as it is commonly known, when cut into small pieces, planarian regenerates an entire imago from each piece. Similarly, if an embryo of a frog is cut in half during its bicellular to octa-cellular phases, a complete imago of a frog grows out of each half. Moreover, with a variant of a newt that has doubled number of chromosomes and body size also, it has been proven that the body in virtually same size can be regenerated when the number of cells was reduced to a half. Salamanders are also known to retain its individual memory even if considerable part of its brain was excised. These facts prove that in each cell and in any part of a brain, the essential information to recall the whole is contained. That is to say, cells and brain have a holography-like structure, in which the whole is folded inside part. In this context, part always reads in and understands the whole in order to determine the self. This suggests the deep connection to the formation of a complex network between cells and the brain.

In the life world also, similarly to the material world, the whole and part are closely

linked together, and concurrently to the inclusion of part within the whole, that of the whole within part occurs. The whole and part are inseparable, and upon the mutual integration between the whole and part the life world is established. Therefore, the element reductionism that intends to elucidate function and structure of the whole by dismantling it into parts does not hold water.

The society operated by humans is also established upon the mutual integration between the whole and part. The society consists of relationships between individuals, yet individuals cannot exist without social relations. In that sense, the establishment of an individual presupposes the existence of the society. Just as the society fails to exist without each individual, each individual would not exist without the society. In human society also, part makes the whole and at the same time the whole makes part. Another way to put it, No whole could exist without part, and no part without the whole.

In fact, even though the society is composed of groups of individuals, it exceeds the total sum of each of the individuals. Therefore, it is impossible to reduce the society into its component individuals. In that sense, it is possible to say that the whole precedes part. Each individual cannot be formed as individuals without something that is whole, such as the society.

Indeed, individuals often have confrontation with the society. Individuals could be in a negative relation with the entire society. Society also could often have confrontation with individuals and negative relations. The relation between individuals and the society is both interdependent and mutually negative at the same time. However, it also brings changes to both individuals and the society.

Each individual reflects the entire society within themselves, comprehends it, and whether cooperatively or opposingly, determines their own actions. Through this the society itself also changes. Within each individual the society is reflected, and when it is expressed as an action, the society changes. When individuals are in the society, the society is inside individuals, and thus the society is generated. The whole changes when part exists within in the whole and the whole within part. Through the whole and part being closely connected and mutually integrated, the society is established and operates.

The mutual integration of the whole and part can also be formed between the cosmos and things existing among it. All individual existences, such as galaxies, stars, planets,

substances, life organisms and humans, are also the expression of the cosmos. The cosmos is, like a grand river, a flow that continuously generates and changes. Each individual existence generated in the cosmos is something like a vortex formed in the flow. Therefore, each individual existence generated in the cosmos is a part of the entire cosmos and reflects its whole. This is evident in the fact that not only humans but also all life forms carry within their bodies various rhythms such as days, months, seasons or years, resonating and sympathizing with the rhythm of the cosmos. It is impossible to consider us and the cosmos as something separate from each other. The fact that we are alive means that we are always connected closely to the majestic cosmos. The planet earth and all the life forms living on it are both existence as minute as a grain of sand if compared to the entire cosmos. However, within that minute existence the entire cosmos dwells. Again, the whole is immanent in part, and part reflects the whole.

Generally speaking, the whole cannot exist without part, and part without the whole. The whole is dependent on part, as part is on the whole. The whole and part are in interdependent relation. The world is generated from the interdependence between the whole and part. Since the whole thoroughly depends on part, if part disappears the whole would collapse. However, at the same time part depends thoroughly on the whole and hence if the whole collapses, part would lose its meaning. The world continues its self-forming, while the whole includes part and part the whole.

In all phases from the cosmos, material world, life world to human society, the world is a complex system composed of the mutual integration and interaction between the whole and part.

Reflecting Back on Eastern and Western Philosophy

Kant and Hegel are the ones who left unique ideas about the whole and part. Among them, Kant contemplated on an organism in the relation between part and the whole, with a special emphasis on the points where the whole precedes part. In an organism, just collecting parts would not make the whole. Rather, the whole with unity is formed when all parts are integrated in such manner so that they can mutually be both cause and result for each other. Moreover, each part can be formed only when it is related to the whole¹⁰. Kant's idea was remarkable not only because it surmounted Descartes, who attempted to solve the problem by separating the whole into as many small parts as possible, but also it already anticipated today's idea of complex systems.

On the other hand, Hegel perceived the whole and part as something correlative. The whole consists of parts and would not exist if a part is missing. Therefore, the whole does not possess its existence within itself but rather inside the others. The whole returns to itself as something that contains the self-denial within itself. However, part also consists of the whole as well and cannot exist without it. Part can only hold its existence within the whole and holds the whole as the moment for the self. Part could be part in the form of including the whole. The whole and part are mutually autonomous and correlative at the same time. The whole and part are a circular motion¹¹. This idea of Hegel that considers the whole and part as something mutually integrating is also valid in analysis of complex system.

The correlation between the whole and part Hegel explains agrees with what Kegon philosophy argues. Hozo, who completed Kegon philosophy, analyzed the relation between the whole and part in *Five Chapters of Kegon*, and explained it with the concept of three pairs and six phases, that are universal and individual phases, similar and different phases, and interactive and independent phases. Hozo also suggested that these phases are in the relation of total integration free from obstacles. Hozo utilizes the metaphor of a building to explain. The universal phase indicates the unified phase of the building as the whole, whereas the individual phase indicates the different parts of the building. The similar phase describes how each parts of the building cooperates to compose the whole, whereas the different phase shows the difference of each individual parts that compose the whole. The interactive phase describes the aspect of how each different parts interact to compose the whole, whereas the independent phase depicts how each part of the building holds its own individual characteristic and never gets mixed with others. Nevertheless, Kegon philosophy asserts that all these phases are not separate existences but one¹². This supports the argument of the relation between the whole and part being neither too close nor too apart, both of them holding their own uniqueness and integrating at the same time. The whole exists because of part, and part because of the whole.

Nishida also asserts the mutual integration between the whole and part. Nishida especially focused on the aspect of the world begin creatively formed through the inclusion of the whole within part. By reflecting the whole within part, part limits the whole. With such paradoxical self-identity of the whole and part, individual limits itself in expression and creates the world actively. Just as changes in the society also are caused by acts of individuals reflecting the society, the creation is caused by the

paradoxical self-identity of the whole and part¹³.

In the world of mutual correlation, the whole and part in their relation of interdependence are mutually integrated and are included within each other. Therefore, the circulation of mutual understanding, the whole cannot be comprehended without the comprehension of part and vice versa, becomes valid in this world. Thus, by the whole limiting part and part the whole, the world forms the self. This is the very structure of the world of complex system, which is enthusiastically studied today.

The Whole within Individual

Similar thing can be valid if “the whole and part” were replaced with “the whole and individual”. In the world that consists of the mutual correlation between each individual event, the whole is formed through the mutual interaction between individuals with characteristics. In such circumstance, the whole depends on and is regulated by individual. Concurrently, individual also is regulated by the whole, determines its own behavior and changes. The whole and individual are inseparable. Through the spiral-like mutual limitation between individual and individual as well as individual and the whole, the world forms itself. The world is a complex system that is formed by the mutual correlation between individual and individual as well as individual and the whole.

The reason why the world is generated in such way through the mutual limitation between the whole and individual is because individual is within the whole and at the same time individual includes the whole. Through being within the whole, individual reflects the whole within itself and keeps its motion, which is also what brings changes to the whole.

This is easier to comprehend if put in the relation between the society and individual. The society consists of the mutual correlation and interaction between individuals. Moreover, each individual is concurrently bound by the regulation of the society. An individual is an individual within a society. Society as the whole is reflected individually and held within each individual. Within a society also, individual exists within the whole and at the same time the whole exists within individual. Therefore, society can change through the mutual interaction between individuals each of which includes the whole within. Society also is a complex system that changes with the spiral-like mutual restriction between the whole and individual.

Tetsuro Watsuji, in his authored book titled *Rinrigaku* (Ethics), also perceived human as the existence that holds two moments, individuality and totality. Moreover, Watsuji considered that neither of them could exist on their own, and that they could only exist in the mutual correlation with others. What is more, Watsuji suggested that individuality and totality denied each other, and that this denial act of totality and individuality is what drives the ceaseless creation in the human existence¹⁴. However, among this, Watsuji heavily tended to search for the essence of ethics in the return of individuality to totality that followed the denial of individuality by totality. Nevertheless, the ceaseless creation by society is achieved through individuality regulating totality, reflecting totality within individuality and acting upon it. The aspect of society being changed by individuality restricting totality should also be extracted as the essence of both society and ethics.

Nonetheless, such structure of human society is a structure valid not only in human society but also in worlds of life and material, as well as the global ecosystem and the universe.

Kitaro Nishida also perceives the structure of this world as the relation between the world and individual things. In Nishida's perspective, individual things exist within the world and the world within individual things. The world and individual things are in the relation in which include and reflect each other. Individual thing is a composing element of the world and at the same time becomes creative moment for the world through restricting itself. Forming of the self by an individual thing is equal to the world's forming of itself. Creative act of an individual thing is creative forming of the world itself. Without the creative act of an individual thing, there is no historical forming of the world. The world ceaselessly creates itself through the mutual restrictions between individual things, as well as between individual things and the world¹⁵.

The same thing can be stated transposing this relation into that of the world and the self. The self does not exist on the outside of but in the inside of the world, and functions as the creative element of the world. Functions of the self, such as learning or working are also historical events conducted in the world. The self's restriction of the self is equal to the world's restricting the world itself. From the world's point of view, the world is containing the self-expressive element that is the self, within the world itself. In Nishida's opinion, the world and the self are in the mutual integration through mutual restriction.

“When the world becomes conscious, our selves become conscious. When our selves become conscious, the world becomes conscious.”¹⁶

The well-known words of Nishida straightforwardly expresses this fact.

However, Nishida tends to deny applying this structure of the historical world sufficiently to the world inferior to human world, such as those of life and material. Nevertheless, even in material world, self-forming takes place through the whole being read into an individual, which is exemplified in phenomena such as the self-repairing of a damaged crystal. Taking this in consideration, what Nishida calls the structure of the historical world must be considered as the structure of the world itself, including all types of worlds from material world to the universe.

Macrocosm within Microcosm

The world is formed by the whole being held within part and individual and the world getting inside part and individual. This structure of the world can be perceived as the relation between macrocosm and microcosm. Each individual event in the world expresses and reveals the entire world. Countless events that exist in this universe are expression points that reflect the entire universe. Each individual of us humans, animals and plants are all expressions of the entire universe. Just as we live within the universe, the universe lives within us. All and every event in the world are microcosms reflecting macrocosm. Not only that, but all the universe expresses and forms itself in such manner. Thus, by doing so, the universe also consistently flows and changes.

Thoughts that the entire universe dwells in all things – in a small flower blooming in the field, in a grain of sand or in a drop of dew – had been around since old times everywhere in the world. However, we must perceive it as something dynamic rather than static as it had been described in these old expressions. Because flowers, sand and dew keep changing without a rest, the universe itself also keeps changing. The universe exists within all things and all things exist within all things, continuing to change together.

Leibnitz also perceived all individual things (monads) existing in this world as the living mirror of the universe. Monad expresses the entire universe with its representational function. Monad is the microcosm that reflects macrocosm¹⁷. However,

since Leibnitz's point of view focused on the representational function of monad, the aspect of the interaction between universe-reflecting monads that creatively forms the universe itself was relatively faded.

The thought of macrocosm being reflected within microcosm is discussed by *Kegon-kyo* as well. The worldview of *Kegon-kyo* describes how the entire universe dwells within each individual thing and the infinity within finity. However, different from Leibnitz, it does not symbolize only the simple mutual reflection of the representational function. The thoughts of Kegon had captured the aspect of the temporally changes and forming of both microcosm and macrocosm, brought by each individual microcosm expressing the entire universe. In that respect, Kegon philosophy can be considered as the pioneer of the basic thoughts for today's complex system science.

3. Field and Individual

The Universe and the Material World

Things that exist in the universe are all mutually linked with other existence. They work together under this mutual linkage, and that is the very reason why when a disturbance occurs in a corner of the universe, whatever it may be, it goes all the way around to affect the entire universe. In this universe, all things are mutually connected and closely tied together to form a field. Materials existing in the universe are also connected to other materials inseparably, forming continuation with the entire field. This universe is a unified field. Everything that exists in the universe ceaselessly generates as part incorporated into a field.

The same can be stated about material world. In contemporary physic, particles are considered as not an individual independent from the field but rather as something like a stitch weaved out by the field. The concept of force, which belongs to classical physics, is also considered as interaction between particles in the field. The interaction between particles is described as the exchange of quanta unique to the field, which is then replaced with the concept of the force. In this context, a phenomenon can be observed, in which two particles are closely linked with each other despite the physical distance between them. Such non-local mutual linkage between particles indicates that individual, separate and local existence is naturally impossible in material world. In material world, particles appear as inseparable part of the field. Not only that, everything including material, mass, energy, time and space are all unified into the field,

mutually linking in the field and is perceived as something inseparable. All things are mutually connected and forming the indivisible whole.

What constitutes the essence of the field theory is the concept of relation. Material world is the network of relations generated by various parts of the unified field. The essence of particles also is comprehended in the series of relations with other particles. In material world, a material is considered as a bundle of energy woven deep into the field, and as an event that manifests from the field. Therefore, such an event is deeply connected with the field it manifested from. Generations and changes of material also is comprehended as the change in the field.

Life World and Human Society

In life world also, interactions among genes, cells, organs and life forms form the field, and they also interact with the formed field while continuously flow and change. For example, gene takes in information from the outside, rearranges itself according to the environment and changes, as an independent life form. In immune system also, variety of immune cells reload genes in different context according to the environment of the field when conducting risk management. It is performed by the interactions between immune cells that read in the circumstance of the exterior. Moreover, in growing of organs also, stem cells comprehend the field they are placed in, determine their own directions, take out the necessary information from genes and self-form themselves. Therefore, stem cells are capable of creating cells of different lineage when placed in a different circumstance. Cells also determine their own status while comprehending the circumstance they are placed in.

Field in the life world, which is also referred to as the environment, is formed by the mutual relation between each individual life. Moreover, each individual life also changes through this interaction with the environment. What is more, the environment itself also will be newly created along with the change. Today's global ecosystem is formed through successive creations of new environment, which had been created through changes brought by the interactions between the environment and the life forms, which were created from the environment of the primitive earth. Life world is what exhibits infinite creativity through such circulative interaction.

Human society also consists of the field of human relation. In this field, the self and the other cannot be separated, and each individual is mutually connected and linked with

each other. It is with this network of mutual linkage that the field of society is formed. With this field, the meaning and value of an action is prescribed and at the same time with this action the field also gets prescribed and changed. For example, we change our outfits according to the variety of the field and produce merchandise according to the field called the market. Concurrently, the field of human relation and the market are also changed by those new outfits or products.

Interaction between individual persons forms the field and the society. However, at the same time, individuals get regulated by the society formed. Through interactions between individual and individual, or the society and individual, the society gets changed. When individual moves the society changes, and when the society moves individual changes. Individual is not an existence isolated from the society.

Interaction Between the Field and Individual

Regardless of the section cut out, whether be it the universe, material, life or society, the world is the field of mutual linkage. In there, individuals interact with each other in all directions, and with that the field is formed, and through the interaction between the field and individual, the world generates and changes in spiral. Individual limits the field and the field limits individual, bringing changes to both the field and individual. Individual interacts with each other and forms the field, and at the same time reads in the field into itself, changes itself according to the field, and with that change transforms the field itself. The field manifests within individual and individual within the field, and from the interactions between individual and individual as well as the field and individual, generation occurs. Then, this generation will create a new field. The world flows and changes through the mutual regulation between the field and individual. It is the world of generation and of the creative complex system.

End Notes

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3. Whitehead, *Process and Reality*, Harper, 1960, pp. 29-32.
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16. Nishida, *Tetsugaku Ronbun-shu Daigo*, p. 559.
17. Leibniz, op.cit., 56 63, pp.103-105, p.109.

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