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## Four Patterns of Time Concept : From a Comparative Sociology of Time

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## Four Patterns of Time Concept —From a Comparative Sociology of Time

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### Introduction

In this paper, I would like to present a logical scheme in which *time* can be analyzed from a point of view of comparative sociology. This scheme would form part of a fundamental framework to compare different cultures, by focusing on the human cognition of *time*.

Whereas the world has advanced from a *primitive* status in ancient times to the modern society, there have been many factors and elements which have induced developments in the world such as the advent of trading system, monetary economy, cities, nations, legal system and so forth. These elements have been intermingled together, influencing each other, and have generated the dynamism for evolution. This process triggered the creation of modern concept of *time*, which encompassed various parameters in itself like quantitateness, measurability, abstractness, infinity, linearity, irreversibility and others. In this paper, I would like to focus on a mechanism of logic through which human cognition of *time* has been established.

In the scheme of comparative sociology, primary interest has been inspired for the construction of framework of general logic. This attempt does not aim at the extinction of uniqueness or specificity of cultures, but rather it tries to define and accentuate idiosyncrasies of particular cultures in contrast with others. For this purpose, it is required that a reference scheme for such a comparison be established in the first place. There ought to be more than one schemes of logic for generalization which are to be used as criteria by which particularities of each culture or society can be better understood. Here, I would like to propose a paradigm of comparative sociology which, I believe, can be one of those useful vehicles for the observation.

What is most well known in the area of cultural comparison based on the temporal concept is *linearity* and *circularity*. The idea is that there has been a stark contrast between *linear* and *circular* concepts of *time* which were shared among different civilizations in history. This contrast is often explained as differences between the Christian or Hebraistic perception of *time* on one hand, and the Greek or Hellenistic cognition on the other. The modern concept of *time* which we carry

today are often defined as *linear*, whereas those in primitive societies are considered to be *circular*.

Nevertheless, E.R. Leach criticized the above mentioned notion, saying that many primitive societies lacked a concept that time was a continuity of homogeneous entities moving forward. These features such as *continuity*, *homogeneous* and *moving* could be represented by a *circular* geometry. On the contrary, primitive societies did not envisage such characteristics of *time*. Instead, *time* was experienced or perceived by people in the distant past as an iteration of heterogeneities such as 'night and day', 'winter and summer', 'drought and flood', 'old and young' or 'life and death'.

Biblicists such as Kurman, Rudolf Karl Bultman and others emphasized that the Hebraistic perception of time was different from that in modern times in that it was not manifested as quantitative or abstract infinity in those days. According to them, time for ancient Hebrews meant a span between *kairos* (qualitative time). *Kairos* were 'creation', 'extinction' and so on.

Aurelius Augustinus faced a question of whether time could be defined as an infinite entity, which thought seemed to have gained wide support in the Hellenistic civilization. He said, "Seeing therefore thou art the Creator of all times; if any time had passed before thou madest heaven and earth, why then is it said, that thou didst forbear to work? For that very time hadst thou made: nor could there any times pass over, before thou hadst made times. But if before heaven and earth there were no time, why is it then demanded, what thou didst? For there was no THEN, whenas there was no time." (*Confessions*)

As for the final end or extinction, Bultman said, in his book *History and Eschatology*, "In the new world,..... time and year would be regressed to nothing, and there would be no month, day or hour to exist." As are evidenced in these notions, the Hebraistic perception was that time was a linearly divided entity and that it was determined by *arche* (beginning) and *telos* (end). In contrast, Newton's

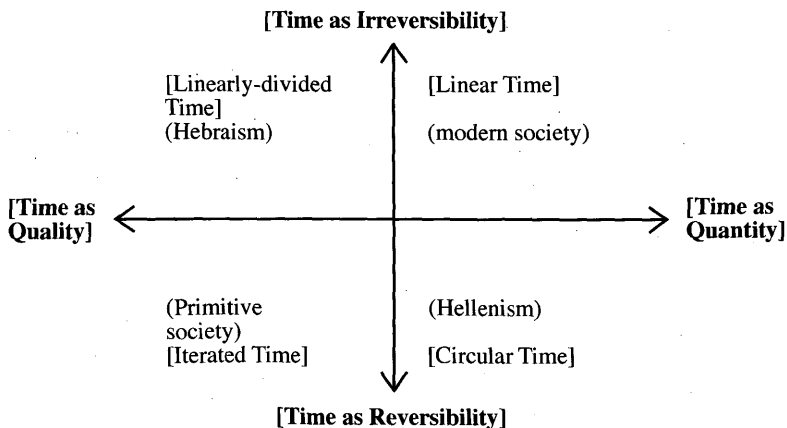


Figure 1

*absolute time* was discussed as a homogeneous entity which was to extend infinitely. The core concept of the Hellenistic time was, however, not that time was linearly divided, but that, as was emphasized by Christian theologians, time was qualitative, and not quantitative.

Whether it was defined as *linear* or *circular*, each notion of time included dual concepts as its subcategory, that is to say, *concrete* and *qualitative* on one hand, and *abstract* and *quantitative* on the other. Thus we can identify four basic phases of time in ancient people's way of cognizance, which is shown in Figure 1.

### 1. Ancient Japan: a preliminary case analysis

When we walk into the lobby of the National Museum of Anthropology in Mexico City, we never fail to notice an enormous mural on the right hand side, where how the ancient Aztec envisaged the world is presented. Juxtaposed at the centre of the mural are *Quetzalcoatl* (snake with wings) and *Witzypochitori* (jaguar).

The former symbolizes the sun, namely day, whereas the latter represents night. They are deities which govern day and night, respectively. According to the Aztec, the world was defined as an everlasting fight between the snake and the jaguar. Every morning, *Quetzalcoatl* dispels *Witzypochitori* to introduce the sun to the world. Conversely, when the evening comes, the latter launches a counterattack, expelling the day, and the world is governed by the night. What they represents is a confrontation of two worlds, between which there is no commonly shared entity. This notion coincides with the description of time propounded by E.R. Leach, who said, "Time is an entity which does not sustain. It is an iteration of series of regression."

In ancient Japanese myths, *Amaterasu-Ō-Mikami*, sun goddess, and her brother god, *Tsukuyomi-no-Mikoto*, ruled the day and night, respectively. The other name of Amaterasu is *Ō-Hirume-no-Muchi*, which means the goddess of day. In Japan, however, these goddess and god were not engaged in confrontation. They ruled two worlds, day and night, separately, without interfering each other. It was an order given by their father, *Izanagi-no-Mikoto*, who was one of the creators of this world.

What is unique to the Japanese myth is that, in addition to the above-mentioned deities to rule the day and night, there was another god called *Susanō-no-Mikoto*. *Susanō* was the brother of *Amaterasu* and *Tsukuyomi*, and he was a source of continuous nuisance to them. *Susanō* was ordered to govern the sea by his father. If we regard the sea as a symbol of 'chaos', how conveniently we can construct the theory of triangle which would be fancied by Structuralists! Here, however, I would refrain from being drawn into the discussion on 'chaos', though the subject looks extremely fascinating.

The three deities in Japan were ordered by their father god to govern the day, night and sea, respectively, which is a rather peculiar division of power from the

modern point of view. Strangely enough, the temporal category is somehow mixed up with the spatial category.

At the same time, we should note that *Amaterasu* is the goddess of *Takamaga-Hara* (the Plain of High Heaven), which entitles her as the goddess of Heaven, instead of day. Thus introduced here is a spatial division of power between *Amaterasu* and *Susanō*. The sister was assigned to the heaven, whereas the younger brother was associated with the sea. This reasoning sounds convincing.

The problem still remains, however, because there is no way to explain how the sea (*Susanō*) is related to night (*Tsukuyomi*). As a matter of fact, what was symbolized by this myth was the coexistence of temporal and spatial categories. In this myth, the contrast between day and night or heaven and sea manifested the heterogeneity of the world.

Now let me touch upon the two most representative anthologies of *waka* poems in ancient Japan. One is *Manyō-Shū*, which was compiled in late eighth century, containing 4,516 numbered poems during the seventh and eighth centuries. The other is called *Kokin-Shū* which was compiled about 910 by imperial command, collecting poems in the ninth and tenth centuries. By looking into various expressions of time in some of those poems, I would like to identify how temporal cognition was developed or changed over time in ancient Japan.

Some anthropologists have reviewed 'cow clock' or 'flower calendar' in primitive societies in the world from the perspective of cultural anthropology. By the same token, we can observe 'tide clock' or 'moon clock' in the following *waka* poem, which was composed in the middle of the seventh century. This poem has often been quoted as a proof that people in the *Manyō* period lived in a concrete time phase which was calculated by the tide clock or moon clock.

*Nigitazuni Funanori Semuto Tsuki Mateba Shihomo Kanahinu Imaha  
Kogiidena. (Manyōshū 8)*

(While we have waited for the moon to rise, the tide is in at last. Let us set sail for the journey. The time has come.)

This poem was composed in 661. Interesting enough, a clepsydra (water clock) was built in the previous year. *Nihon Shoki* (Chronicle of Japan, oldest official history of Japan covering events from the mythical age of the gods up to the reign of the Empress *Jitō* [r. 686–697]) has a record of this development.

*Hitsugi-no-Miko Hajimete Rōkoku-wo Tsukuru.  
Ōmitakara-wo-shite Toki-wo Shirashimu.*

(Crown Prince had a clepsydra constructed for the first time in this country. His subjects were given *time* accordingly.)

'Rōkoku' is a water clock. The crown prince in this reference was *Nakano-Ōe-no-Ōji* (Prince *Naka no Ōe*), later the Emperor *Tenji* (*Tenchi*) [r. 661–672], who initiated and vigorously promoted the *Ritsuryō* system (the system of centralized patrimonial rule, informed by elaborate legal codifications called *ritsuryō*). Under his leadership, the society underwent *Taika-no-Kaishin* (*Taika* Reform, political and economic reforms carried out from 645 to 649), which was culminated in the compilation of *Ōmi Rei* (*Ōmi* Code, legal code compiled under the Emperor *Tenji* in 668. Japan's first legal formulary). The record describes further that, in the tenth year of the Emperor *Tenji's* regime, there was a water clock installed in the new capital of *Ōmi*.

*Rōkoku-wo Atarashiki Dai-ni Oku. Hajimete Toki-wo Utsu. Shōko-wo Todorokasu.*

(The clepsydra was placed on a new stand. *Time* was struck for the first time here. Bells and drums were used for the announcement of *time*.)

I believe that the sound of bells and drums introduced an abstract notion of *time* for the first time in history into the life of ordinary citizens. At this stage, *time* came to be recognized by people as an abstract entity which connoted two heterogeneous worlds of day and night. The following poem clearly shows a situation in those days when those bells and drums represented only an *externally* imposed time, which was quite remote from a traditional and deep-rooted rhythm in citizens' life.

*Minahitowo Neyotono Kaneha Utsunaredo Kimiwoshi Omoheba  
Inekatenukamo. (Manyōshū 607)*

(Although the bell has been struck to announce the time to go to bed for the citizens in the capital of *Nara*, I can't go to sleep at all, because I think of you, missing you all the time.)

This poem was composed in the middle of the eighth century. It dawns on us how indifferently ancient Japanese people envisaged the clock, even scores of years after its construction, and so many years after the first sound of bells and drums to announce the officially defined time. In modern society, the *time* defined by the clock has penetrated people's daily life so deeply that it has almost become self-discipline in individual homes and persons. In stark contrast, however, the sound of ancient clock echoing in the distant, notifying citizens of the time to go to bed was quite alien. It seemed as if the clock symbolized the power of state and the external authority outside people's day-to-day life. It represented the forced visibility of time which had been introduced in society by the establishment.

The other poem *Nigitazuni* was composed by *Nukata-no-Ōkimi* (Princess

*Nukada*, a famous female poet in the late seventh century), substituting the Emperor *Saimei* (the wife of the Emperor *Jomei*). It was created in a salute for the departure of Japan's navy ships bound for *Shiragi* in the Korean Peninsula, aiming at the rescue of the allied nation of *Kudara* which was under the attack of *Shiragi*. Modern Japanese people somehow seem to prefer another interpretation for this poem, claiming that it is a romantic poem of love about a man, who has been waiting for the tide to be in, in the moonlight, in order to set off by boat to reach the opposite side of the river where his love waits for him.

Nevertheless, however, the poem was nothing but a tribute to the Emperor's navy which was about to set sail for a journey in order to wage war upon the neighbouring country. At stake in the war was the power and authority of the ancient imperial state which had been born only a short time before.

Later, after the demise of the Emperor *Saimei*, *Nakano-Ōe-no-Ōji*, the Crown Prince who had had the first clepsydra built in Japan, organized a caretaker government and compiled *Ryō* (an ancient statutes at large) in the new capital of *Ōmi*. Thus there was rapid progress made towards the establishment of a *Ritsuryō* state under his leadership.

The poem was born in this particular context. It sounds as if it symbolized a critical moment of nation-building in Japanese history. It was shortly before the time when the society experienced the advent of bureaucracy in the framework of statutes at large. This newly born state, which had emerged from a more primitive society in which time was recognized by the use of 'tide clock' or 'moon clock', keenly pursued the universality of time.

The measurement and announcement of 'hour' was an integral part of the nation-building effort on the basis of legal codes. For the same purpose, the calendar system was established and a chronicle was compiled. All of them were aimed at the introduction of a system for abstract and universal time. While the names of eras were changed with the transfer of capitals, from *Ōmi*, *Fujiwara* through *Heijō*, the society was steadily transformed from a more naturally structured community to the one of abstract and rational orientation. The announcement of hour was deeply interconnected with the process of creation of abstract space in these capitals.

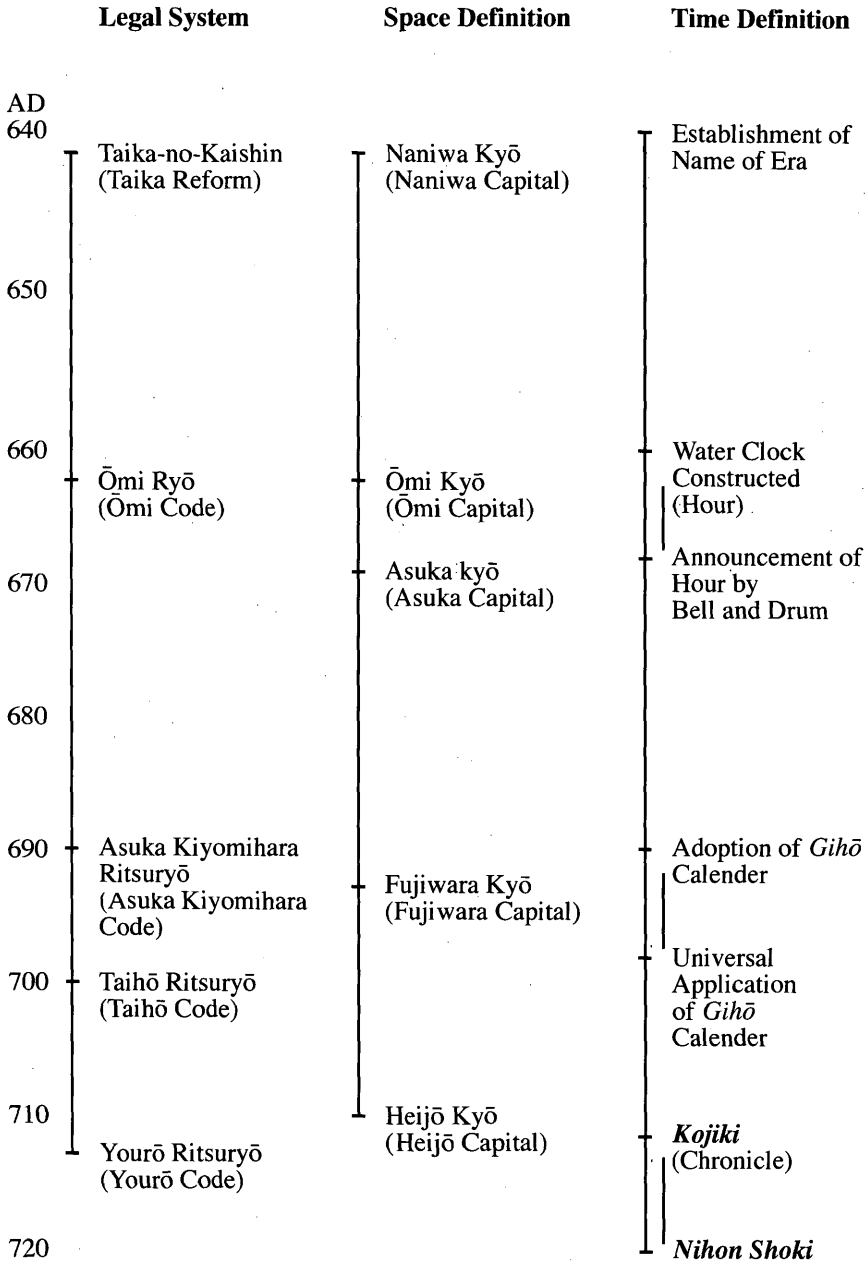
At the end of the eighth century, the capital was moved to Kyoto and the *Heian-Kyō* (*Heian Capital*) era commenced, signifying the maturation of a long and stable ancient nation state. *Kokinshū* which was compiled in the early tenth century was an anthology of *waka* poems, in which a cognizance of time was strongly reflected in the book itself as well as individual poems.

The first poem in this anthology is as follows:

*Toshinouchini Haruha Kinikeri Hitotosewo Kozotoya Ihan Kotoshitoya  
Ihamu.* (Kokinshū 1)

(The Beginning-Day-of-Spring has already come before the old year ends.

**Creation of Space and Time in Ancient State of Japan**



**Figure 2**

What should I call this very time of the year? Is it still the old year? Or should it be called the new year once the Beginning-Day-of-Spring has come?)

It was a so-called *Risshun* (Beginning Day of Spring) poem when *Risshun* happened to fall in the old year. All that this poem was about was that the starting day of spring was actually designated by the calendar, while the natural spring season came with some time lag from the designation. In addition, the reference to the coming spring was quite simple without any description of specific events or phenomena in the environment. When comparing this poem with those in *Manyōshū*, we can observe that the perception of season in this anthology was already considerably alienated from natural events or phenomena.

*Sodehijite Musubishi Mizuno Kōreruwo Harutatsu Kefuno Kazeya  
Tokuramu. (Kokinshū 2)*

(When I went to the mountain in summer, I had a chance to scoop water in my hand from a spring and the water wetted my sleeve. Today is the Beginning-Day-of-Spring. I wonder if the ice around that spring is being melted when the first spring wind blows today.)

The poet did not notice the spring-coming by observing the ice being melted. Instead, he knew that fact by the calendar. Then he imagined that the ice must be being melted in the field. The socially defined perception of season came first, which triggered the poet to imagine the state of natural environment.

*Harugasumi Tateruya Izuko Miyoshinono Yoshinono Yamani Yukiha  
Furitsutsu. (Kokinshū 3)*

(I wonder where on earth the spring mist is. Although it is already spring by calendar, it is still snowing in Mount *Yoshino*.)

*Yukinouchini Haruha Kinikeri Uguisuno Kohoreru Namida Imaya  
Tokuramu. (Kokinshū 4)*

(The first spring day has come while it is snowing. If a nightingale cries, with tears running down her cheeks, the tear drops will get frozen in cold winter. When spring comes, however, are they being melted in warm weather today, I wonder.)

There are a few possible interpretations for the third poem. The point is, however, that, whatever image had been carried in the poet's mind, the poem was placed and incorporated in the anthology as the one which described the poet's

wonder about the time lag between the first day of spring as designated by calendar and the development in nature. From the point of view of anthologists, it was considered that the poem focused on the same subject as the previous one.

In the fourth poem, the main subject was the Beginning-Day-of-Spring specified by calendar. As is pointed by *Yasushi Nagafuji*, the perception of season in the *Manyō* period, when the rice crop had manifested fall and the budding of blossoms had heralded spring, was not followed any more. He said, "In the first place, seasons were determined purely conceptually in the framework of intangible or invisible time. Then *waka* poems, which were a culmination of individuality and uniqueness, were placed in the artificially designated frame of time. Such a process represented the very core of the cognition of season which was shared by those anthologists during the *Kokin* period." (cf. *Kodai Nihon Bungaku to Jikan Ishiki* [Ancient Japanese Literature and Cognition of Time])

During that period, time was dissociated and extracted from events in nature (abstract), to become an independent object for human cognition. This cognition became an entity with which the significance of events in nature was defined, while poets were observing natural phenomena in their environment. The structure of *Kokinshū* makes clear that the calendar was the frame of reference, that the perceived time in the world was an object for human perception and that those poems were composed about life and the world based on the assumption that man was the being within time.

The poems in *Manyōshū* generated their dynamism by describing the particularities of people's experiences without being alienated from the current and present time. In contrast, those in *Kokinshū* objectivized the 'stream of time', thus treating natural phenomena and social events as materials with which time could be objectivized. We can identify this approach in most of the poems in *Kokinshū*. In fact, many scholars of ancient Japanese literature have pointed it out in unison.

There is another important difference between *Manyō* and *Kokin* periods in terms of temporal cognition. In the former, the world was defined as everlasting (*toko*) and time was thought to be reversible (*wochi*), both of which were deep-rooted in people's perception of time. Those very senses, however, were degenerated in the latter, when time came to be something irreversible.

*Harugotoni Hanano Sakariha Aenamedo Ahimimukotoha Inochi*  
*Narikeri.* (Kokinshū 97)

(Blossoms are in bloom every spring. What a wonder and blessing it is, however, that I am here today to appreciate the beauty of these flowers!)

*Akino Kiku Nihofukagiriha Kazashitemu Hanayorisakito Shiranu*  
*Wagamiwo.* (Kokinshū 276)

(While there are chrysanthemums in full bloom emitting the charming

fragrance, I will put them in hair in tribute for life. No one knows if I shall be able to outlive these flowers. It might happen that I pass away even before these flowers are gone.)

These two poems represent a human perception that man has been isolated from the cyclic processes of nature and that, unlike nature, human beings are to have only one chance of existence in the world. They can inspire a deep feeling in our mind about irreversibility of time. In *Manyō* poems, except for those in the very last period, there was hardly any poem which manifested a sheer recognition of irreversibility of time. On the other hand, the *Kokin* poems were created based on a sharp sense of reality, envisaging death of poets themselves as an inevitable consequence. It is evident that their sense of death was induced by their cognition of time, which was intellectually objectivized during the *Kokin* period.

The contrast is clearly exemplified in the following poem, which was about a place called *Karasaki* on Lake *Biwa*. In the mind of *Manyō* poets, this place symbolized eternity or what would never change over time. Conversely, in *Kokin* poems, the place was quoted to signify time which was eventually converging to 'nothing'.

*Kanokatani Itsu Karasakini Watarikemu Namijiha Atomo*  
*Nokorazarikeri. (Kokinshū 458)*

(When did those people row the boat across the lake to reach *Karasaki*, I wonder. There is no trace of waves caused by the boat on the surface of waters.)

The composer of this poem was *Abono Tsunemi*, who was a government official to compute 'time' to make an official calendar.

The background of this poem was that, in the process of formation of the ancient state from *Nara* through *Heian*, bureaucracy was strongly established in society. A large part of the population came to live an urban life for generations in the isolation of the cyclic developments in nature. Those poets were aristocrats or their subordinates who led their life mainly in the circles of the Imperial court. Gradually, they became somewhat dissociated from the traditional family clan or blood-oriented community, which was the basis of life for *Manyō* poets. In the daily life, *Kokin* poets had to undergo a complicated process of power struggle to seek hegemony in the court.

As is realistically described in *Makurano Sōshi* (A set of essays written by a female author in the late tenth century), people in the court were pleased or saddened about how they could go up the ladder for promotion in the government. The process of prosperity and decline was accelerated in the bureaucracy based society. In Volume 18 of *Kokinshū* are there many poems which express the dismay and despair of those who were exposed to uncertainty and irreversibility of

time. As a matter of fact, in many cases, those people were inspired to compose poems, because they had failed in the promotion or lost their status in the government.

The transfer of capital to *Kyoto* itself was the finalization of such processes in which people had been increasingly dissociated or alienated from their traditional milieu. As was pointed by Hirano, the set up of *Heian* Capital in *Kyoto* meant the segregation of the Imperial Court of *Yamato* from places and deities, that had provided the Emperor with a very source of power and authority in the mythical age. It was inevitable that the move to the new capital accelerated the process of alienation of clans from myths. The myths were indeed the foundation of clan communities. (cf. Hirano: *Zoku Kodai Nihonjin no Seishin Kōzō* [Psychiatric Structure of the Ancient Japanese])

According to *Sadayoshi Kida*, *Tatusaburō Hayashiya* and others, the construction of capital in *Kyoto* heavily depended on the economic strength of the clan of *Hata*, a family clan who was ruling this area. The *Hata* clan had accumulated their financial resources from cottage industries as well as commerce in their territory. They had been a major player of monetary economy in those days. The mother of *Fujiwara-no-Tanetsugu* and the wife of *Fujiwara-no-Oguromaro* were both from the *Hata* clan. *Tanetsugu* and *Oguromaro* were main proponents of the transfer of capital to *Kyoto*.

As for how deeply the monetary economy penetrated in society, *Nihon Ryōiki* (the earliest Japanese collection of Buddhist moral tales compiled around 822) gives us a remarkably realistic picture. In this book are there many tales about money; for example, tales about a son who lent money to his own mother with a high interest rate, mercilessly demanding her to repay it, or about a father who stole rice crops from his son's paddy field to be reborn as an ox, or about a rapid decline of a wealthy family after the death of parents, whose daughter came to suffer an impoverished life, or about a Buddhist monk in *Nara* who lent money to his son-in-law to be thrown into the sea by him when demanding the repayment and so forth.

What is evidenced by these stories is the violent energy of monetary economy, which exercised its power over people especially overwhelmingly at the stage of initiation. The vehement energy of money penetrated in the deepest end of society, shaking the daily life of people. By this tremendous force, the process of history was relentlessly accelerated.

## 2. Hellenism: an origin of time as quantity

Normally, Plato and Aristotle are noted as philosophers who considered time as *cyclic* in the tradition of Hellenism. Where was this idea originated in the history of ancient Greek philosophy?

The epic poetry written by Homer in the ninth century B.C. is a splendid representation of the fragility of human life and the overwhelming power of destiny

which commands human beings. In spite of this feature, however, what is missing in Homer's epics is an abstract concept of time, let alone *time* as a measurable quantity. As was pointed by G.E.R. Lloyd, the myths and tales in Homer's poetry belonged to the non-specific past. There was hardly any notion in his works that *time* was a long-lasting continuity.

It is said that Hesiod, another ancient Greek poet, wrote his book called *Works and Days* around the seventh or eighth century B.C.. The poems in this book were characterized as advice to farmers about agricultural activities through the year like a so-called agricultural calendar. Despite such a function, however, no particular interest was shown in this book in time itself, which was subjected to a cyclic process.

We can speculate, therefore, that the image of *circular time* was not a naturally inherent perception among the ancient Greek, but that it was developed somewhere in the historic process which the Hellenistic civilization had undergone. The question is which stage it was.

What is well known as part of the initial representation of *circular time* in ancient Greece is the following notion by Anaximander, who talked about *apeiron* (the infinite).

Things are destined to go back to their origin from which they were originated. It is because, owing to their own injustice, they are to compensate each other and satisfy each other, in accordance with the system of order which is determined by *kronos* (time).

Those who established the notion of circular time even more clearly were Pythagoreans, who maintained that events were to be regressed in certain cycles. For example, Empedocles was influenced by the philosophy of the Miletus school which had been initiated by Anaximander as well as Pythagoreanism. He left the following remarks, which completed the image of circular time:

There are what is one and what is more. They prevail in turn as *time* circles round.

Against what background were these ideas born?

Anaximander was a prominent philosopher in the early sixth century B.C.. He was a follower of Thales, who founded the Miletus school. Miletus was the centre of Ionia, which was located on the opposite side of Greece across the Aegean Sea. Miletus played a pivotal role for regional commerce and trade in those days. Although there is hardly any document left about Thales, it is said that he was from Poinique, according to Herodotus and Democritus. The ancient Greek history recorded that "for the first time in history, in-depth knowledge had been generated in Poinique about numerical figures due to active trading activities." In *Politika* written by Aristotle, there is a reference to Thales, noting that he himself was

engaged in commercial trade.

The original language of the above-mentioned reference to 'things compensating each other' by Anaximander was 'diken kai tisin didonai'. According to Thomson, the original meaning of this phrase was 'the ruling to conclude a conflict between two ethnic tribes'. Of course, it could be the case that the phrase happened to appear in this particular text without any intended implication, and therefore that there was not much meaning in this coincidence. Let us look into a wider context.

Cities in Ionia used to be colonial territories of ancient Greek cities including Athens. During the age of Anaximander, Athens was undergoing a political reform initiated by Solon, which is often considered as a precursor of democracy in later days. Solon was a famous statesman who made efforts to establish *dike* (rule of law) in the *polis*. When the *polis* reached the stage of maturation, it was required to establish a new political system, where vengeance among ethnic tribes were to be eliminated accordingly. It was necessary to replace some traditional custom such as calling down a curse upon one's enemies when disputes took place with new political order. There were aspirations in society to establish an innovative system in which mutual compensation could be assured between different interests based on objective criteria for justice and injustice. Efforts were needed to overcome the limitation of conventional community-based order (*gemeinschaft*), thereby introducing new order for a civil society (*gesellschaft*).

On the other hand, Solon is also known as a propounder of *timocratia* (a polity with a property qualification for the ruling class) in Athens. He classified citizens of Athens into four groups based on the amount of wealth, for which different rights and obligations were stipulated.

In reality, Solon's reform fell through after a few years without accomplishing the original purpose. During the following century, however, through the undertakings by Peisistratos and Kleisthenes, democracy was finally established in Greece.

The very core of the reform by Kleisthenes lay in the dissolution of conventional blood-based tribe communities, which were substituted with ten new *phyle* (tribe). The *phyle* was specified absolutely mechanically. There were ten *phyle* in total, each of which was assigned to a geographical division of land in the *polis*. The division was carried out in a completely mechanical manner. The whole area of *polis* was divided into 100 to 200 *damos* or *demos* (district) as a political unit. Walker evaluated that initiative in ancient Athens under Kleisthenes's reform as follows: "It would go beyond the scope of human calibre and wisdom, if one attempted to work out any organization which could be more artificial and more unnatural than those." It took place in 508 B.C..

As was the case in the civic revolutions which occurred 2,300 years later, the reform in ancient Athens had also been coupled with the introduction of an abstract and rational calendar. During this period, the conventional lunar and solar calendars were replaced with a new one, in which a year was divided into ten *phases*.

Each phase comprised either 36 or 37 days in the interests of the state administration.

The challenge for Solon was to establish the order of civil society, which could replace the traditional tribe-based communities. I believe that cities in Ionia including Miletus also faced with the same challenge in their early stage. Probably they had been exposed to it even before Athens did.

When reviewing the previously stated notion, "all events and phenomena have to compensate each other for the injustice committed by themselves according to the order of *kronos* (time)," by Anaximander, in those historical contexts, it becomes evident that his view of the cosmos was a projection of the pursuit of order which was under way in the civil society gradually emerging in the Hellenistic civilization.

Russel tried to interpret the underlying meanings of Anaximander's remarks, and his discussion seems to be sensible. According to Anaximander, elements such as fire, soil or water (each of which was thought to be a god) always attempt to expand their own territory, whereas the *order of kronos* as the law of nature always restores the equilibrium among them in the environment. For instance, there are ashes after fire, which eventually return to soil.

It is well known that the philosophical pursuit by scholars in the Miletus school was originally inspired by their desire to explore a universality in the cosmos, to which the versatility of the universe could be converged eventually. Whereas Thales tried to seek the universality in water which was a substance itself, Anaximander, remarkably enough, sought the universality in *kronos*. *Kronos* was not a substance, but a generalized system. It was specified as morphological universality in phases to provide order for all events and phenomena on this planet.

Of course, the distinction between 'substance' and 'morphological universality in phases' was only vaguely recognized during that age. It would be fair to say, however, that, whereas each substance had idiosyncratic features of its own, 'morphological universality in phases' assured certain objectivity in it. The objectivity was established through the identification of external commonalities, which would give order to 'the everlasting fight among gods'. *Time* was defined as an criterion for such universalistic order in the world.

What was it which the proponents of political reform such as Solon sought for during that age? It was nothing but the fundamentals for the order in *Gesellschaft*. That order could be universally extended beyond the limit of people's unity in *Gemeinschaft*.

The reason that such objective criteria for universal justice and injustice were keenly pursued was that the society had already moving forward to seek a social relationship which went beyond the limitations of *Gemeinschaft*. As a matter of fact, the emergence of money triggered tremendous changes in society as a vehement external force for universalization, even before people began to realize this very fact. Money was the medium which brought about a series of events of importance as a homogenized criterion.

What was most notable about Ionia was that it was the place of origin for coins, which were distributed in the world through trading activities. The ancient Greek recorded that it was the Kings of Lydia who cast coins for the first time in history. (Herodotus and others) It is believed as true, judged by the trading system and mine resources which Ionia possessed during that period. It was around 700 B.C..

On the other hand, in ancient kingdoms of the Orient including Egypt or Mesopotamia were there no coins for many years. It is said that coins were introduced to the Orient around 546 B.C.. It corresponded with the year when King *Kyros II* of Persia conquered Lydia. Since King *Kyros II* conquered Ionia in the following year, it would be logical to suspect that, through those wars, coins came to circulate in the Orient. It was after these historic developments in these region when China started the monetary system with the *buqian* or *daoqian*, and India with the stamped coins of irregular shapes.

The elapse of time between the advent of the oldest Greek coins called 'Ionian coins' and the reform by Solon was only 100 years. During that period, there was a harsh conflict between two types of money in Greece, namely, 'Aigina standard coins' and 'Euboia standard coins'. (In fact, it was one of the major challenges in Solon's reform to replace *Aigina* with *Euboia* (Ionian standard coin) as the unit for both the monetary economy and the weights and measures.

Solon himself understood well the intensity of seduction of money which could ruin the *polis*. Therefore, it is not correct to say that *timocratia* was enforced upon citizens in Solon's interests. Rather, whatever reform was planned during that century, *timocratia* would have been the only way to materialize such an undertaking. When the society was heavily pressurized by the monetary economy, there wouldn't have been other methods. (On the other hand, it was also true that Solon was engaged in external trade.)

Needless to say, unlike traditional commodity moneys which had been circulated before, coins were designed and produced as money. Coins were a medium with which values of assets and labour could be quantitatively represented. With money, the values of wealth or work could be objectivized. The advent of money required certain conditions in the environment, such as sufficiently stable, regular and diversified relationships among regional communities (or individual persons).

On the other hand, in the perspective of individual people or communities, money was a manifestation of some magical power, which would homogenize all events and actions in this world into stamped coins, thereby exercising overwhelming power in society. Money was a medium which was supported by the entirety of social relationships.

There are famous legends about *King Midas of Phrygia* and *Gyges of Lydia*, which reflect how sensational and wild the repercussion was when the monetary system was first introduced in society. *King Midas of Phrygia* in Lydia made a wish to possess the magical power to change whatever touched his hand into gold.

When his wish came true, the King starved to death. *Gyges* of Lydia gained the magical power to make himself invisible by the 'gold ring with a magical stamp on'. He murdered his lordship and came to the throne. It is said that the old saying, "Man is money," was already known in the seventh century B.C.. Solon quoted a saying, "There is no limit to wealth," which verified the infinite desire for money among people.

Anaximenes succeeded to the *Miletus* school after Anaximander, and completed its philosophy. He thought that *aer* (air) was the *arche* (origin) of all events. Air would be condensed into water, whereas water would be into soil. Conversely, air would be diluted into fire. As far as the superficial presentation is concerned, his idea looks as if the same as that of *Thales* who proposed the theory of four elements.

However, what was unique to Anaximenes was that he defined those elements not as quality, but as weights and measures which were based on the criteria of condensation and dilution. Furthermore, it was Anaximander who built a bridge between *Thales* and *Anaximenes* by proposing the issue of quantitative sequence among the four elements.

It was Pythagoreans who enhanced this approach to a more sophisticated level to define all phenomena in the world as quantity. Money was a classical example of quantification of value. About the same time as *Anaximenes* was around, Pythagoras was born in *Samos*, which was a primary economic opponent of *Miletus*. When he was about forty years old, he moved to *Kroton*, which was the most flourishing city in commerce in Italy. According to Seltman, Pythagoras founded the famous 'Brotherhood' in this city, and started to mint coins. Pythagoras's 'Brotherhood' gradually achieved political power in this city to extend their influence to prosperous cities in the neighbouring area as well. In the surrounding cities, citizens began to use coins with the identical design as those in *Kroton*, which was the late sixth century B.C.. Although it is still questionable that those coins were minted by Pythagoreans, it is indeed true that the time when coins emerged in these areas corresponded with the time when the Pythagorean Brotherhood advanced its power over a wide range of citizens in society.

The unique attribute of coins, especially of simple coins in earlier stages, was that they not only translated commodities into quantity, but also manifested goods in numerical figures and unit. It seems that the very fundamental theme of the Pythagorean school, "The cosmos is a mathematically ordered whole," was the culmination of observations of daily life of people.

Around that age, the universe was recognized as numerical figures. Such a concept was not developed as a consequence of a purely academic endeavour, but as a result of the sophistication and generalization of citizens' ideas in society, which could be traced back to the notions of time during the era of Plato and Aristotle.

It is well known that Plato explained the origin of *time* as follows:

The Mighty Creator, Demiourgos, defined the Heaven as a projection of

eternity which was to proceed according to numbers, which he named time.

Aristotle's definition of time was, "Time is ... the number of motions with regard to the existence of a first and a last."

While the Pythagorean school upheld keen interest in the enlightenment of society, it was also influenced by Orphism. Empedokles was an earnest follower of Orphism, and there was some impact of this sect on Plato, too. Orphism advocated the cycle of reincarnation for living creatures. It seems, therefore, as if the ancient Greek notion of *circular* or *cyclic* time could be justified, if one tried to do so, perhaps too easily as the progress and dissemination of Orphism in society. It is evident that Pythagoras, Empedokles and other philosophers in those days, who propounded the notion of *cyclic* time, had at least been exposed to and influenced by Orphism.

Nevertheless, the reincarnation in Orphic mysteries meant that the soul was segregated from the flesh at the end of life, going down to the Kingdom of the Underworld ruled by Hades where the judgment was made. Depending on the conducts during one's life, the one was to be reincarnated as another soul in human beings or animals. In this sense, it was not quite the same as the circularity of time. As far as the temporal cognition was concerned, the Orphic concept of retribution was quite distant from the Pythagorean perception that events and phenomena were to mechanically regress in a certain cycle. In Empedokles, the perception was further abstracted into that of time circles, which was never existent in Orphism.

Orphism itself derived from the temporal conception in ancient agricultural communities before the advent of the Hellenistic civilization. When that perception encountered the Hellenistic *logos* in which *time* was objectivized, quantified and abstracted infinitely, at the interface of the two streams, there emerged the image of circular time. It was probably an inevitable development, as I assume. A circle was a geometric representation of 'infinity' for ancient Greeks. The Orphic mysteries involved the sense of iteration of life and death, which had had its source in prehistoric communities of mankind. When it encountered the *logos* of quantification and objectivization, the merger resulted in the Hellenistic cognition of circular time.

It is obvious that the Orphic view of retribution gave a profound impact to the formation of Greek concept of circular time. However, not everything could be explained by this similarity. Whatever is left unexplained by that notion has triggered deep interest on our part, since it has manifested the essential feature of Hellenism.

In the 'Introduction' of this paper, I defined the Hellenistic manifestation of time as the synthesis of two variable functions, that is to say, *reversibility* and *quantity*. What has been the main focus in conventional approaches to the Greek perception of time is *reversibility*. The reason is that, in those studies, major interest of researchers has been laid in the comparison between ancient Greece and modern times or between Hellenism and Hebrewism.

Having said that, I also note that in the comparative studies between ancient Greece and Hebraism, sometimes close attention has been paid to the issue of *quantity*, too. What we should not overlook is, however, that *quantity* was focused on as a vehicle to accentuate the idiosyncrasies of Hebraic cognition. *Quantity* was never the centerpiece of the study itself. There had not been much interest in the origin or background of *quantification* until modern times.

In the modern perspective, *quantity* and *quantification* of time have been a very close subject. We know that the concept of reversibility of time was universally shared in primitive societies. Therefore, if what was all about the Hellenistic cognition of time had been simply a sense of *iteration*, there would be no need for us to bother such a study any more. However, the Hellenistic representation of time was something which could not be totally explained by that notion. The core of their perception lay in such attributes as abstraction and quantification. It is, therefore, this particular subject which would be most vital for our effort to explore the origin and basis of the cognizance of time in modern times.

As a matter of fact, the quantification of time was induced against the background where the monetary economy was developed as the symbolization of dissolution of *gemeinschaft* and the birth of *gesellschaft*. The society was driven forward to new order, by overcoming the limitation of prehistoric communities. I would like to emphasize that the quantification of time took place in this context of history.

### 3. Hebrewism: an origin of time as irreversibility

The *linear* concept of time in Hebrewism derived from eschatology, but not vice versa. Not all eschatology was associated with the perception that time was an entity which was driven straightforward. For example, in the ancient Babylonian or Aztec communities, the eschatology involved the perception of time to be *iterated*. Those people believed that the world was to be ruined repeatedly. Bultman pointed that early Hebrewism had contained the notion of *regression* of time.

Jahwist (Yahwist) left the oldest scripture of the Old Testament called the *J Scripture*. The essential part of Jahwist's faith was that "the beginning and the end were tied together by the Covenant of God, which was to be materialized as the reunion of tribes under the faith of Judaism." Interestingly enough, his thought was entirely the opposite of Kurman's idea that "the beginning and the end were to be distinguished from each other." Kurman thought that this segregation would be the essential doctrine in order for time to be driven straight forward.

About one to two centuries after the compilation of the *J Scripture*, the *E Scripture* was written by Elohist. He shared the same idea as Jahwist, maintaining that the course of history was placed under the Covenant of God, which purpose was to gain (regain) the rule over Israel by David. Elohist said, "History manifests the process of changes through the blessings of God, the guilt of His subjects, the

judgment of God, the repentance of human beings and the forgiveness of God.” (Bultman, R.K. 1957 *History and Eschatology*)

The scripture which was compiled latest in history among the *Torah* was the *D Scripture* edited by Deuteronomium. The time described by Deuteronomium was also an ‘everlasting cycle’ of relationships between man and God, such as the apostasy, the punishment of God, the regression of the apostate to the faith and the salvation by God.

The most recent of the historic scriptures was the *P Scripture*, namely, *Priesterschrift*. Even in this book, the purpose of history was defined as “the return of Jewish people to their homeland from the captivity by the aliens, to reconstruct the holy communion based on the *Torah*.” (Bultman)

It was not until the advent of Apocalyptic Literature including the *Book of Daniel* when the eschatology based on the notion of regression was replaced with genuine eschatology (Bultman). The latter was endorsed by the perception of irreversibility of time. At later stages of Judaism, the concept of circulating time was replaced with the consciousness of the existence of two worlds. This signified the establishment of genuine eschatology.

Together with the emergence of later Judaism, a clear distinction was drawn between the old world, namely the existing world, and the new world, that is to say, the world which is yet to come. This distinction was equal to the end of life, which was to occur but once. Because there was no second time, it was irreversible.

The above discussion was based on Bultman’s theory. At the same time, we can discover some precursors of genuine eschatology, to some extent, in the *Book of Isaiah* and the *Book of Jeremiah*. I will touch upon it later.

Let us compare the eschatology in the Apocalyptic Literature including the *Book of Daniel* with that in old Judaism. The following two features are notable in terms of the temporal cognition.

Firstly, whatever end one might undergo at the end of one’s life, it would not mean a return to the old times through the reconstruction of the Family of David, the release from captivity or whatever. Secondly, a special emphasis was placed on the belief that the end or conclusion would last forever. (*Book of Daniel* Chapters 7 and 21) The first point made clear that the eschatology in here did not contain any expectation of iteration, whereas the second manifested an attitude of positive denial of the iteration.

The point is that such reasoning not only denied the existence of present time, but also vigorously resisted a perception of time that the past was supposed to repeat in cycle to alternately bring about both happiness and unhappiness. It was truly the culmination of human spirit which tried to deny the reality of this world.

The notions of linearity and irreversibility of time were introduced in ancient Greece, where *arche* (beginning) and *telos* (end) were defined to be heterogeneous. On the other hand, in Christianity, as was emphasized by Kurman, the doctrine of ‘what takes place but once, and never again’ was the very basis of temporal cognition among the followers of Christian faith. In fact, the Christian cognition

of time had been already nurtured for many years in the Jewish doctrine of irreversibility of time.

The term 'everlasting' has been used since *Genesis*. It should be noted, however, that the word was often used, particularly in earlier days of Christianity, for emphasizing that the past Covenant would last forever without changing. The following is an example:

And the bow shall be in the cloud; and I will look upon it, that I may remember the everlasting covenant between God and every living creature of all flesh that is upon the earth. (Genesis 9:16)

We can find similar examples in the *Book of Daniel* (6:26) as well. Furthermore, in Chapters 7 and 12, the word appears repeatedly to emphasize that the Kingdom of Salvation would never be ruined, but last forever.

But the judgment shall sit, and they shall take away his dominion, to consume and to destroy it unto the end. And the kingdom and dominion, and the greatness of the kingdom under the whole heaven, shall be given to the people of the saints of the most High, whose kingdom is an everlasting kingdom, and all dominions shall serve and obey him.

(Daniel 7:26-7:27)

Although there is no contradiction between the references in *Genesis* and *Daniel*, what is emphasized in each is opposite. In the former, an emphasis was placed on the point that what exists today would never change forever, whereas, in the latter, it was emphasized that today's world would never come back. In *Daniel*, it was made clear that what is yet to come in the future would not be a regression. In here, the refusal of existence in this world was made adamantly clear.

The concept of *eternity* as the proof of irreversibility dates back to the *Book of Isaiah* and the *Book of Jeremiah* as well.

Of the increase of his government and peace there shall be no end, upon the throne of David, and upon his kingdom, to order it, and to establish it with judgment and with justice from henceforth even for ever.

The zeal of the Lord of hosts will perform this. (Isaiah 9:7)

But Israel shall be saved in the Lord with an everlasting salvation: ye shall not be ashamed nor confounded world without end. (Isaiah 46:17)

However, during this period, the end in the prophesies still meant a recovery in history, such as the recurrence of the dominion of David, return from the captivity and reconstruction of Judah or Jerusalem.

The voice of joy, and the voice of gladness, the voice of the bridegroom, and the voice of the bride, the voice of them that shall say, ..... For I will cause to return the captivity of the land, as at the first, saith the Lord.

(*Jeremiah 33:11*)

As is shown in the examples above, what existed in *Isaiah* and *Jeremiah* was only one of the two characteristics of later Judaism with which the doctrine of irreversibility was established. In this sense, these prophets can be called the heralds of later Judaism.

Chronicles tell us that Isaiah was a prominent prophet in the late eighth century B.C.. While he was a leader for his people, the district of Samaria was conquered by Assyrians. The North Kingdom of Israel was ruined around the same time, which resulted in the captivity of about 27,290 Jews in Babylon. On the other hand, it has been revealed through historic research that the latter section of the Book from Chapter 40 was written in Babylon around the sixth century B.C. during the end of the Babylonian captivity.

It is known that Prophet Jeremiah was active from the end of the seventh B.C. to the beginning of the sixth century B.C.. It corresponds with the time when the Kingdom of Judah in the south was ruined by New Babylonia, which was led to the subsequent captivity of Jews in Babylon.

Included in the Apocalyptic Literature are the *Book of Daniel* in the *Old Testament*, the *Revelation to John* in the *New Testament*, the *Fourth Book of Ezra* (= the *Second Book of Ezra* Chapters: 3-14) of the *Old Testament Apocrypha*, the *Apocalypse of Baruch* of the *Pseudepigrapha—Old Testament* (Syrian version and Greek version) and the *Slavonic Book of Enoch* (= the *Book of the Secrets of Enoch*).

The *Book of Daniel* was written in the middle of the second century B.C., during which Antiochus Epiphanes (= Antiochus IV), the then King of Syria, ruthlessly persecuted Judaism, which subsequently resulted in a massacre of citizens of Jerusalem. (Some scholars claim that the Chapters 1 through 6 date in the third century B.C.. At any rate, the substantive part of Apocalyptic Literature is included in the section from Chapter 7.)

The *Fourth Book of Ezra*, the *Apocalypse of Baruch* and the *Revelation to John* in the *New Testament* were all written about the end of the first century B.C.. They were prepared one after another under a series of merciless persecution of Judaism by Roman Emperors Nero, Vespasianus and Domitianus. The Fall of Jerusalem had also taken place. It is thought that the *Book of the Secrets of Enoch* was written around this era as well.

We can observe, therefore, that all these texts which evidenced the formation of eschatology were written during the age of maximum ordeals and agony for Jewish people. Although most parts of Jewish history have been fraught with sufferings, it is still notable that the concept of irreversibility was established in the times of maximum misery and despair. Actually, prophecies were launched as an

adamant determination to try to find hope beyond the world of despair. This reminds us of the Greek myth of Pandora's box. It was only hope, in other words, the faith in what does not exist in this world, which provided people in agony with the strength of perseverance. (Max Weber, *Ancient Judaism*) Ancient Jews could stand the reality only when they transcended reality of this world.

Under normal circumstances, hope could be perceived by people in ordeals, when they aspired for the return of happy moments in the past. Under the extreme oppression by Antiochus or Domitianus, however, the despair was such that, unless one could conceive a utopia with pure and absolute hope, the one could never persevere with that misery. The problem was that such a utopia of absolute purity could never exist in reality. As a result, it could be only perceived as 'what was yet to come', and as the future which was not the regression of the past. Furthermore, it would be probable that, after having undergone an endless process of repetition of happiness and unhappiness, one would be utterly put off by the structure of regression. Consequently, the one would try to seek what existed beyond the limitation of time, thus pursuing the irreversible salvation, which would not repeat any longer.

Given the geographic features, the natural environment of Hebrewism has never been friendly to mankind. Most of the places have been wilderness and deserts. The cultures have been traditionally anti-naturalism. The history was full of the records of occupation of territories and captivity of Jews by foreign aggression. Through its history, the naturally fostered solidarity in society was often hampered by external forces. All these factors nurtured the aspiration of people to explore the future, which was appreciated as a pure non-existence. They also induced the concept of irreversibility of time.

E.R. Leach contrasted the notion of 'cycle of nature' with that of 'but once and never again' in life. The former was the ground of reversibility of time, whereas the latter was the basis of the irreversibility of time. It is worth noting that Bultman said, unlike ancient Greek historians who never observed history 'as an independent area which was totally segregated from nature', 'the theory of the universe proposed by later Judaism replaced the destiny of mankind with that of the world, thus achieving the independence of history as a separate entity from nature.'

In addition, in eschatology of Apocalyptic Literature, unlike the other eschatology which had been found in other societies or earlier Judaism, the very model of the world was not the regression of nature, but the 'but-once-and-never-again' feature of human life.

The end means that this world grows old to die.

(the *Fourth Book of Ezra* 5:55, the *Syrian Book of Baruch* 85:10, the *Fourth Book of Ezra* 4:48-4:50)

And I heard, but I understood not: then said I, O my Lord, what shall be the end of these things?  
(*Daniel* 12:8)

This last question was indeed the most painful one for Jews that had been born in their mind for centuries. They were upholding the spirit to try to find their *raison d'être* only in the *future*. When this spirit encountered the aspiration for quantification and measurement, it would form a *secular* time concept. Eventually, it was led to the generation of modern cognition of time. (Refer to Chapters 4 and 5 of my book, *Jikan no Hikaku Shakaigaku* (Comparative Sociology of Time) for the reference of development of the pre-modern and modern consciousness of time.)

#### 4. Conclusion: four patterns of time concept

We can conclude that, through the evaluation of several civilizations in continents of the world to date, time could be objectivized as an homogeneous quantity, when a *gemeinschaft* in primitive society was transformed into a *gesellschaft* with the order of a civil society. What triggered such a development was an external force which convinced members in society of the need to translate a traditional notion of time based on the intra-community homogeneity into an innovative perception of inter-community consciousness of time.

It is said that, in the Western history, the ancient Greek civilization was the homeland of the above-mentioned perception of time, since it had established homogenized quantity. It was a typical urban civilization, too. Furthermore, when an economy matured enough to require the manufacturing of coins or money, the quantified time came to acquire a clear status as an object. This theory was discussed in Chapter 2.

At the same time, it was not until people became aware of the but once and never again feature of human life when the irreversibility of time was fully appreciated. At that stage, time had lost the repetition in nature. In the West, Hebraism was the origin of the consciousness of time as an entity which was driven straight forward. Hebraism was a typical example of non-naturalistic civilization.

We then reviewed how such a perception of irreversible time had been established in human history. It led us to the revelation that the connotation of nature in those perceptions did not simply refer to real nature which surrounded human society, but that the nature was the entirety of denial of beings and repetition in this very world. It should be also noted that the concept of doing was juxtaposed with nature.

In other words, nature accommodates all that exists. When nature was deprived of all the causes for consummatory pleasure of life, and thus transforming itself into an entire denial and rejection, there came the emergence of irreversible time. It was the manifestation of values such as the anti-existence and anti-present. Under those circumstances, the salvation could be offered only within the irreversible time. This discussion was presented in Chapter 3.

Bearing those in mind, we can reconfigure Figure 1 in the following way. New dimensions such as naturality versus humanity, communality versus

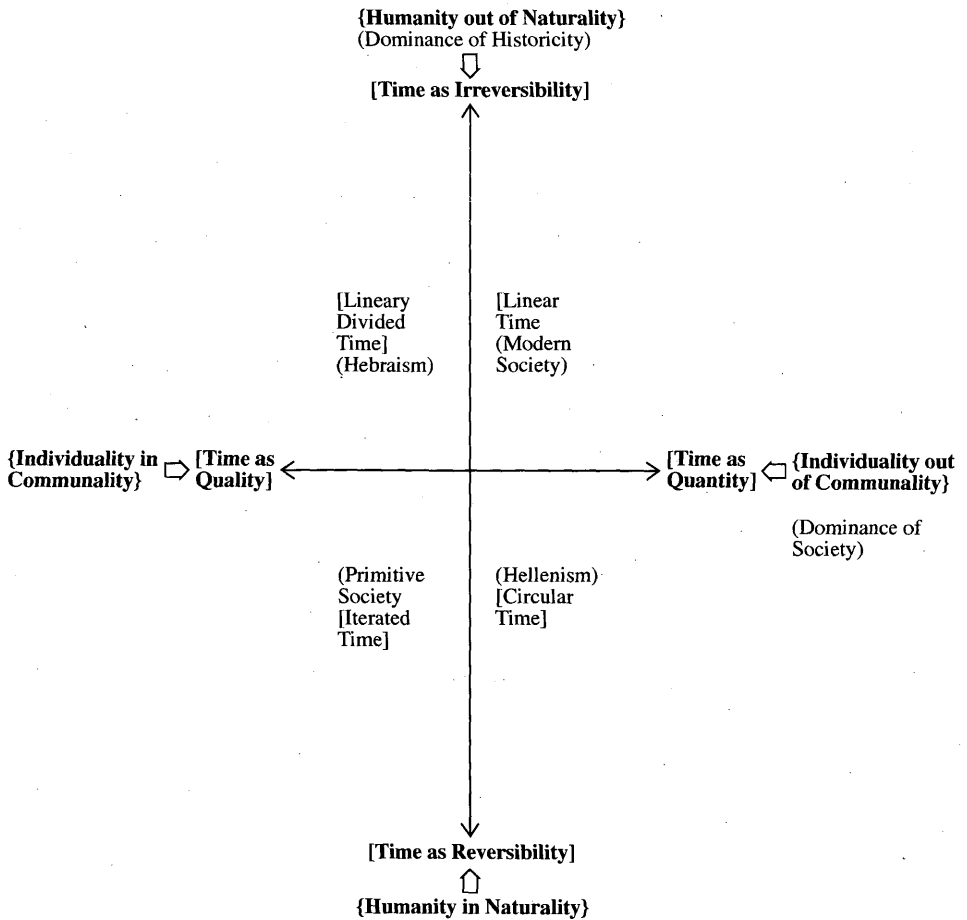


Figure 3

individuality or inclusion versus transcendence can be introduced in the coordinates.

Naturality was recognized as a milieu of all that existed in the world, whereas humanity was juxtaposed with it as an independent entity which tried to transcend the former. When a society fully developed the awareness of these two dimensions, the cognizance of time discovered its irreversibility.

By the same token, when those who lived in a community came to recognize the existence of a concrete system where mutual inter-dependence among individuals was integrated (*gesellschaft*), which was extended beyond the limit of homogeneity of conventional time perception, the cognition of time as quantity was clearly established.

Our task was to explore the spacio-temporal origin of the pre-modern civil society. To this end, I would like to propose Figure 3, in which the perspective of

comparative sociology is superimposed on Figure 1.

We have reviewed the perception of time in Hellenism and Hebrewism. Both of them are considered as a bridge in terms of temporal cognition between primitive communities in ancient times and modern civil societies. At the same time, these two represent a sheer contrast in terms of how to perceive time.

What is important is that we should not be obscured by a superficial confrontation between phenomena, such as Hellenism versus Hebrewism. Instead, we must pursue and elucidate how the perception of time has been constructed through history. We need to relate the quantification or objectivization of time to the social and cultural developments of the world. It is required to discover the mechanism and process through which the cognition of time was established. We are interested in when, where, why and how time was defined as an irreversible entity that is continuously driven forward. This effort would lead us to a generalization of certain mechanisms, thereby enabling us to apply the reasoning to other societies and cultures than Hellenism or Hebrewism. For example, the generalized criteria might be applicable to Japan after the establishment of the ancient *Ritsuryō* state, or pre-modern literature or philosophy in Europe.

In this paper, I have identified two basic pattern variables. They are focus on reversible phase vs. focus on irreversible phase, and specificity as quality vs. abstractness as quantity. It is important for us to continue our effort to relate these two variables to the fundamental structures and specificities of human societies to date. It would be useful if we could discover how these variables have been correlated with phenomena such as cities, states, money, legal system, religion, literature, art, people's way of thinking of life and so forth.

